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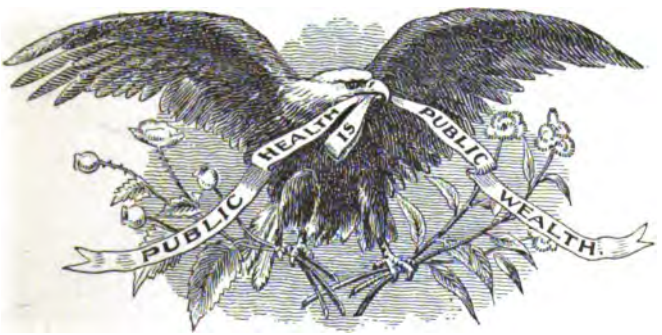
# THE

# SANITARIAN,

## A MONTHLY MAGAZINE

DEVOTED TO THE

## PRESERVATION OF HEALTH, MENTAL AND PHYSICAL CULTURE.

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# THE SANITARIAN.

JANUARY, 1896

NUMBER 314.

## SANITARY BRUSHWOOD PICKED UP IN EUROPE.

By C. W. CHANCELLOR, M.D.

### No. V.

### VENICE—ITS CLIMATE AND SANITARY CONDITIONS.

FROM the celebrated baths of Acqui, near Turin, where I gathered the heap of "Brushwood" sent THE SANITARIAN a month ago, I have journeyed in Italy to Genoa, Pisa, Rome, Florence, Bologna, Milan, and, lastly, Venice, one of the most interesting spots in the world, and a far more healthfu place to live in than is usually believed, particularly if certain hygienic precautions are carefully observed.

It is difficult, and, perhaps, impossible to find a city which strikes the eye and impresses the fancy more remarkably than Venice. Not only has nature lavised peculiar beauties upon the place, but art has also adorned it with the choicest treasures, so that the city has become an immense museum where everything is most original, tasteful, and unique. The observer, admiring the splendid buildings around him, wonders how a community of merchants, always occupied in trade, politics, and warfare, could originate and superintend the construction and execution of so many marvels of grandeur which call to mind the fables of the "Arabian Nights." The elaborately wrought marbles in the palaces, the superb paintings and mosaics in the churches—above all in St. Mark's—symbolize the riches, grandeur, and wisdom of this once powerful people here, whose history is written, chapter by chapter, in tombs, monuments, and palaces.

Venice, "the pearl of the sea," is situated in the lagoons of the inner extremity of the Adriatic on one hundred and fifty islands joined together by three hundred and sixty-seven bridges, and connected with the mainland by a railway bridge nearly three miles long and thirty feet wide. It has 160,000 inhabitants, and is divided into two unequal parts by the Grand Canal. The most important part is that which includes St. Mark's Square and the wonderful edifices around it. At the east end of this square is the Piazzetta, a small area bounded on the left by the Doge's Palace, once the seat of government and the residence of the chief of the State. This palace is connected by the Bridge of Sighs, with a prison on the opposite side of the canal which separates these two noted buildings that recall visions of strangulation, starvation and torture, and the executioner's fatal axe. Either much sympathy and sentimental pity has been wasted on these buildings, or everything of the past is now disguised and robbed of its horrors. They have been represented as comprehending every means that could intensify torture, and writers of romance have blackened them with horrors which have made their very names a reproach; but no one who has visited the dark dungeons of Newgate, or Baden, or even some of our American prisons, would endorse the verdict that the prison cells of Venice were the worst in the world. John Howard, the philanthropist, declared that the prison was the best arranged, as regards health and the claims of humanity, that he had ever visited.

To Byron may be attributed much of the interest attaching to these historic structures, and especially to the Bridge of Sighs, and it may not be amiss to quote the lines which made the spot immortal:

> "I stood in Venice on the Bridge of Sighs—
> A palace and a prison on each hand;
> I saw from out the wave her structure rise
> As from the stroke of the enchanter's wand.
> A thousand years their cloudy wings expand
> Around me, and a dying glory smiles
> O'er the far times when many a subject land
> Looked to the winged Lion's marble piles,
> Where Venice sat in state, throned on her hundred isles."

It is never, perhaps, worth while to disabuse the mind of

any healthy poetical sentiments; but modern writers are now agreed that "the palace and the prison" of which Byron sung in such mournful lyrics are not associated in any way with the names of great state prisoners, but merely with low and common criminals, who deserve no more sympathy than we should give to the same class of prisoners in Sing Sing.

Ruskin describes the Bridge of Sighs as "a work of no merit and of a late period;" and he adds that it owes "the interest it possesses chiefly to its pretty name and the ignorant sentimentalism of Byron;" and Howells, in his capital book, "Venetian Life," describes it as "that pathetic swindle, the Bridge of Sighs." Despite such criticisms, however, it is a fine covered structure, and does connect the prison with the ancient palace of the Doges, where sat the Council of Ten concealed while they listened to the answers of witness or accused.

Turning now to that part of the city's history which more directly concerns the readers of THE SANITARIAN, we find that Venice has been subjected at various times to fearful visitations of the plague, and in the year 1631 sixty thousand of the inhabitants were swept away by that disease. When the epidemic was at its height the Doge, Contarina, and the Patriarch, Tiepolo, entered into a covenant to erect a memorial in honor of the Virgin as soon as the plague should be stayed. It is said that on the same day that the covenant was made the plague ceased, and immediately after the church of Our Lady of Health was built by the Senate as a thank offering. The visitor to this beautiful votive church will see upon the high altar a fine group of marble by Le Curt, representing the Virgin banishing the demons of plague. The plague is represented as a frightful old hag flying away in terror before the Angel of Health. Another church, the Santa Maria dei Frari, possesses some interest for the sanitarian. It contains a number of interesting monuments: one the monument of Titian, the celebrated painter, who died of the plague in 1576. A law had been made that no remains should be buried in the churches, but that all the dead bodies should be carried beyond the precincts of the city; an exception, however, even in the hour of terror and anguish, was made in favor of Titian. His remains were borne with honor to the tomb and deposited

in this church for which he had painted his famous "Assumption" and other pictures.

The Venetians long ago recognized the fact that a high degree of health is intimately blended with prosperity, and accordingly they enacted uncompromising provisions against those preventable diseases which had swept over the city from time to time, desolating homes and crushing the brightest hopes of the community.

Originally Venice consisted of a few islands formed in the midst of broad lagoons; six rivers, flowing from the Alps and the Tyrol, discharged their waters into the Adriatic, and the meeting of these rivers with the sea caused a deposit of mud and sand in such a way as to create little islets, irregular in their outline, and varying in their size, which at low water were surrounded by beds of yielding silt, a condition apparently adverse to health; but every day the blue waters of the Adriatic rose above them, giving security not only from the alarms of war, but also from disease. Overhead there was stretched a sky of azure brightness like a gorgeous ceiling, while in summer gentle zephyrs, scent laden with aromatic perfumes from the surrounding mountains, played about the dwellings, and in winter time the sea tempered the cold blasts as they swept out from the mainland toward the Gulf of Venice.

As population increased and trade commenced the unsanitary conditions made themselves felt. The undrained soil and foul surface contaminated well water and vitiated air until a form of government was established—first under tribunes and then by doges—that set to work to drain the marshes, bank up the rivers, and connect the islands by bridges. The work accomplished in the early days of Venice must have been stupendous. The canals were made and preserved; man's enterprise had to do battle with the assailing ocean; a forest of piles had to be sunk to hold the shifting sands. Yet the huts of the early settlers gave way to marble palaces, and the group of desolate islands, stolen from the sea, was converted into one of the chief cities of the world. The culmination of Venice's greatness was witnessed in the fifteenth century. From her earliest days until the close of that century, step by step, she rose higher and higher until the whole world ac-

knowledged her to be the centre of commercial prosperity, and from that time until she was taken by the French in 1797 it steadily went down, the population having declined from over two hundred thousand to about one hundred thousand.

At the present time Venice forms an important part of the kingdom of Italy, and is progressively showing signs of returning prosperity. The climate is temperate. The mean temperature being about 37° F. in January, the coldest month, and about 73° in June, July, and August, the hottest months.

There are no horses, cabs, carriages, or road conveyances of any kind in the city; but the walk ways (narrow passages between rows of high houses) are well paved and free from dust and dirt. The streets proper are the canals, and the gondola is the only vehicle that runs upon them except steam ferry-boats that ply upon the Grand Canal every ten minutes. The gondola does duty for cab, omnibus, cart, coach, wagon, wheelbarrow, and hearse. It is to be found everywhere, and everybody rides in it to theatres, churches, shops, business, and in making social visits. A funeral procession, with gondola after gondola draped in black, presents a scene of mournful magnificence well described by the poet Rogers:

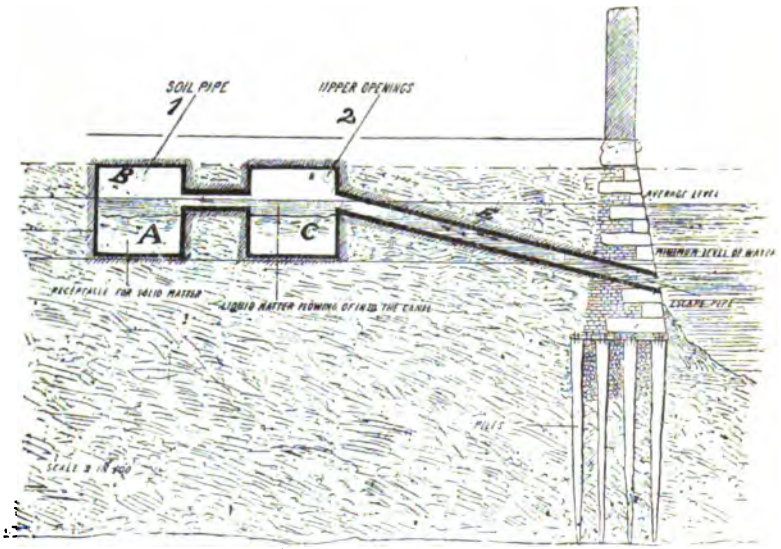
> . . . "Steering in,
> And gliding up her streets as in a dream,
> So smoothly silently--by many a dome,
> Mosque-like and many a stately portico,
> The statues ranged along an azure sky;
> By many a pile in more than Eastern splendor,
> Of old the residence of merchant kings."

From a sanitary point of view, the most important improvements made in Venice during recent years are the drains that have been built for the houses, and the water-works. The water is brought by an aqueduct from a natural spring in the mountains, sixty miles distant from the city, and is conveyed by a pipe to the reservoir, whence it is pumped to the dwellings. Since these improvements have been made the sick-rate from typhoid-fever and other zymotic diseases has greatly diminished; and gastric-fever, formerly so common, is now much less frequent and of a far less serious character, and consequently much easier to cure. Great care must be taken not

to drink well water, which is always more or less contaminated by infiltration from a filthy soil.

The construction of drains for the houses has been a great step in advance for the healthfulness of the city.

The following drawing will give a good idea of how this drainage is accomplished :




The soil pipe (1) empties into the receptacle *A* through the orifice *B*, and the household waters enter the receptacle *C* through the second orifice *B*. The solid matters from the water-closet settle in *A*, while the liquid portion is drawn off through the pipe *E* to a point below the lowest water level. There is a species of tide in the canals in Venice which occurs twice a day, and which amounts to from two to three feet. This tide, which raises the depth of the water in the canals, dilutes the waste from the pipes and then carries it off to the sea. As for the solid matter, it is no longer carried off into the canals as it used to be, but is taken away, in a closed apparatus, outside of the city limits, where it is made into manure. In this way has been abolished the chief cause of the former unhealthfulness of Venice, which is now superior in point of health to many other European cities. During the

year 1894 the death-rate in Venice was 22.3 per 1000 inhabitants, which is noticeably lower than that of Pisa, Florence, Genoa, Naples, and Cairo, all largely frequented winter resorts. The following table shows a comparative view of the health of Venice with five other large cities :

DEATH-RATE PER 1,000 INHABITANTS.

| | Venice. | Paris. | Monaco. | Florence. | Cairo. |
|---|---|---|---|---|---|
| 1st quarter. 1894..... | 31.5 | 23.3 | 24.8 | 33.6 | 53.2 |
| 2d " 1894..... | 19.3 | 21.7 | 24.0 | 20.7 | 55.8 |
| 3d " 1894..... | 19.2 | 17.8 | 24.2 | 16.5 | 55.0 |
| 1st " 1895 .. ..... .. | 29.4 | 26.3 | 27.0 | 31.0 | ? |
| 2d " 1895..... | 22.0 | 20.3 | 23.5 | 21.5 | ? |

According to this table, it appears that the death-rate is much higher during the first three months of the year, and yet that is the season that many people select for a sojourn in Venice. The same remark is true for Florence and for many other Italian cities. It is during the summer months that the death-rate is lowest, and it would, therefore, be preferable to choose the spring or fall months for a visit to Venice—April and May, September and October are the most favorable months.

In this connection, it is interesting to note that intermittent fevers are very rare in Venice, and for this reason the city has become quite a resort for persons suffering from malarial poisoning.

The absence of dust in the atmosphere of Venice, its pavements in large flagstones, the saline dampness of the air, and the high atmospheric pressure are said to form an excellent group of conditions for lessening the spread of consumption ; and in statistical tables recently published the death-rate from pulmonary consumption is shown to be relatively very low. Thus on an average there is in Venice only one death from consumption per ten from all causes, whereas in Paris the proportion is more than double that. Below is given a table of the death-rate from phthisis during 1894 and for the first two quarters of 1895 :

| | Pulmonary Phthisis. | Tuberculosis of Various Organs. | Total Deaths from Tuberculosis. | Total Deaths. | Percentage of Deaths by Tuberculosis. |
|---|---|---|---|---|---|
| 1st quarter, 1894..... | 58 | 21 | 79 | 1,309 | 6% |
| 2d " 1894..... | 73 | 15 | 88 | 818 | 10.7% |
| 3d " 1894..... | 78 | 20 | 98 | 824 | 11.8% |
| 4th " 1894..... | 80 | 18 | 98 | 782 | 12.5% |
| 1st " 1895..... | 91 | 17 | 108 | 1,235 | 8.7% |
| 2d " 1895..... | 95 | 15 | 110 | 930 | 11 8% |
| Total..... .... | 475 | 106 | 581 | 5,898 | Average, 9.8% |

Examination of this table shows that the death-rate from phthisis is at its minimum during the first three months of the year. There are not many cities where the death-rate from this disease goes down during these months to such figures as 6 and 8 per cent. ; Venice may, therefore, be considered a good winter resort for persons suffering, not with far advanced phthisis, but with a predisposition to the disease and in danger of picking up contagion. In sending a consumptive to Venice, it would not do to choose a chronic, advanced case, but nervous, anæmic, and excitable patients in the first stages of the disease may reasonably hope to be benefited.

The following summary of the death-rates of fifty-two large cities will give an idea of their relative rank, respectively, in point of healthfulness. It will be seen that Venice stands next to New York City ; and Paris, which has a poor reputation for healthfulness, stands *eleventh* in the list with a death-rate of 20.2 per 1000 inhabitants :

*Death-rate per* 1000 *Inhabitants for the Year* 1894 : Berlin, 17.2 ; London, 17.7 ; Amsterdam, 18.0 ; Ferrara, 18.2 ; Copenhagen, 18.7 ; Zurich, 18.9 ; Brussels, 19.0 ; Rome, 19.6 ; Nice, 19.7 ; Philadelphia, 19.9 ; Paris, 20.2 ; Dresden, 20.5 ; Lyons, 20.6 ; Ravenna, 20.6 ; Livorno, 20.6 ; Bologna, 20.8 ; Baltimore, 20.9 ; Berne, 21.0 ; Lucca, 21.1 ; Bordeaux, 21.3 ; New York, 21.4 ; Venice, 22.3 ; Vienna, 22.8 ; Magdeburg, 23.0 ; Cologne, 23.1 ; Pistoja, 23.6 ; Munich, 23.7 ; Liverpool, 23.8 ; Pisa, 24.3 ; Budapest, 24.3 ; Gratz, 24.5 ; Dublin, 24.7 ; Perugia, 24.7 ; Florence, 24.7 ; Warsaw, 25.0 ; Milan, 25 6 ; Genoa, 25.6 ; Rheims, 25.8 ; Modena, 26.2 ;

Verona, 26.8; Brescia, 26.8; Catania, 27.3; Naples, 27.3; Barcelona, 29 6; Bucharest, 29.9; Trieste, 30.3; Rouen, 31.3; St. Petersburg, 31.4; Alexandria, 33.0; Bombay, 33.2; Moscow, 34.1; Cairo, 53.1.

There are other interesting facts that could be related about Venice from a sanitary point of view, but this would lead beyond the limits of this article.

A brief reference to the future of the city and I have done. It is quite evident that the place is on the highroad to regain part, at least, of its former commercial importance. During my sojourn there the *Thames*, the first steamship of the P. and O. Line, now to run between Venice and the East, anchored off Malamocco. A steamboat carrying the city authorities went out and conducted her in triumph into Venice.

When the *Thames* anchored, the city assessors, the Chamber of Commerce, foreign consuls, and distinguished citizens went on board. Captain Symonds welcomed them and treated them to champagne, and complimentary speeches were exchanged. The P. and O. company are to give a banquet to the city, and the Chamber of Commerce will return the compliment. There is no doubt that the running of this line of steamships will bring many people and much trade to Venice, and will certainly be followed by the inauguration of other steamship lines.

HAVRE, November 8, 1895.

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THE MALARIAL PARASITE.—Investigation of this parasite (?) is in progress in India by Surgeon-Lieutenant-Colonel Lawrie and Surgeon-Captain P. Hehir, of the Indian Medical Service, and others. It began June 8th, and continued daily till August 15th. Fresh blood was taken and stained preparations made from 116 cases.

They allege that they have found the microscope to be misleading and useless in the diagnosis of malaria, and that there is no parasite in that disease. "There is nothing in pure blood but hæmocytes and leucocytes—red corpuscles and white cells." They declare the so-called parasite of malaria to be nothing more than a blue-stained nucleus of the leucocyte, the white cell. They say that the appearances described by Laveran and others are to be found in healthy blood.—*American Microscopic Journal, November*, 1895.

# THE MOST SUITABLE AMERICAN CLIMATE FOR CONSUMPTIVES.*

By A. H. STEWART, M.D.

WHILE it has been well said that tuberculosis "is a disease of all times, all countries, and all races," and "that there is no known climate that makes it a necessity or renders it an impossibility," yet there is no fact in the etiology of the disease better established than that it is more prevalent in some countries and among some races, and some individuals are more susceptible than others, and that persons suffering from the disease do better in some climates than others. The inevitable conclusion, then, is that those climates in which the disease is most prevalent either favor the development of the specific organism of the disease, or render persons residing in such climates more susceptible to the action of these organisms, or both.

Laboratory experiments show that moisture, darkness, bad ventilation, and moderate warmth increase the vitality and virulence of these specific organisms, and increase their power to propagate their species, and that dryness, light, especially sunlight, moving atmosphere, and extreme temperature, either hot or cold, especially the latter, lessen the vitality and virulence of these organisms and diminish their fructifying powers. Observation has also shown that cold and moisture, and, to a less extent, warmth and moisture, retard the transpiration of the fluids of the body, both through the skin and respiratory mucous membrane, diminish the excretion of urea and carbonic acid, induce congestion of the internal organs, especially the lungs and kidneys, favor colds and catarrh of the respiratory mucous membrane, lessen hemoglobin and other vital constituents of the blood and tissues, and in this way weaken potential and kinetic cell energy, and favor tuberculosis. While, on the other hand, cold and dryness, and, to a less extent, warmth and dryness, increase the transpiration of the fluids of the body, facilitate excretion of urea and carbonic acid, relieve overtaxed viscera, favor oxygenation, increase

* Read at the June meeting of the Kentucky State Medical Society, 1895.

hemoglobin and other vital constituents, and thereby increase latent and active cell energy, favor constructive metamorphosis, and therefore oppose tuberculosis. It has been further shown that if to dryness there be added a considerable degree of rarefaction, with its usual favorable accompanying influences, sunshine, lowered humidity, lower temperature, and increased diathermancy (power of transmitting radiant heat), the above beneficial effects are doubly intensified, with the additional benefits of accelerated and strengthened heart action and respiration, increased appetite and assimilation, increased thoracic and pulmonary ventilation, and increased absorption of infiltrated exudation and broken-down *debris*. The latter obviates the necessity of forcible expulsion by cough and expectoration, removes so much additional culture soil from the tubercle bacillus, and even an additional amount of bacilli themselves. In this way these climatic attributes exert both a direct and indirect beneficial influence on the body organism, and thus favor the healing of morbid conditions in the lungs.

As the reduction of atmospheric pressure comes at the rate of half a pound to the square inch of surface for each thousand feet of ascent, and as lowered temperature through atmospheric expansion, which also gives rise to lowered humidity, comes at the rate of about three degrees for each thousand feet of ascent, these favorable climatic conditions are naturally found in the greatest abundance in such high, dry regions in the interior of continents as the Alps in Europe, the Rocky Mountains in the United States, and the plains of Nubia and plateaus of Abyssinia in Africa, were solar and terrestrial radiation are the greatest. Consequently these places are fast becoming the Meccas for the consumptives of these respective countries.

It is true that in the United States the Adirondacks in New York, the Lower Alleganies in North Carolina and Georgia, the pineries of Georgia and South Carolina, and the far-famed peninsula of Florida, still have their advocates. They certainly serve good purposes as season resorts, and doubtless give temporary and perhaps permanent relief to many. Indeed, so far as they afford increased dryness and purity of air, and increased opportunities for out-door, open-air exercise,

to that extent they are improvements over home, and are therefore in this indirect way beneficial. But as it has not been demonstrated that the climates of these localities exert any positively curative influence over such pathological conditions as lung cavities, it is little less than criminal when such a disease as tuberculosis is rapidly sapping the lifeblood from our patients, if we are depending upon climate at all, to be content with climates which possess only indirect curative properties, when climates which are known to possess the very highest degree of therapeutic value are within our reach.

In the United States these desirable climatic factors are found in the greatest abundance on the great plains and plateaus of the West.

Indeed, with the exception of the extreme northern portion of the Pacific Slope, most all of that vast region of the United States west of the one hundredth meridian offers greater advantages to the consumptive than even the most favored portions east of this line.

As the principal moisture precipitated in the United States and east of the Sierra Nevadas comes from the Gulf of Mexico and the Atlantic, chiefly from the former, for in the ranges west of the Alleghanies precipitation naturally decreases north and west from the Gulf and Mississippi Valley, and as mountain ranges intercept the passage of rain-bearing winds, the precipitation is less over the plains than over the prairies, and less over the parks and plateaus than over the plains, and still less over the great basin than over the plateaus. The decrease over the plains is gradual as they increase in elevation till the Rocky Mountains are reached, where most of the remaining moisture is extracted, so that west of these there is little vapor to be precipitated. Likewise the Coast Range and Sierra Nevadas extract most of the moisture from the rain-bearing winds which come east from the Pacific, so that little moisture remains after the region of the great basin is reached by these winds. Consequently, as the plateaus are approached either from the east or west, moisture and clouds are diminished, and sunshine and dryness proportionately increased, so that the minimum of the former and the maximum of the latter are found over this central region. Thus the annual average

rainfall at New Orleans is 65 inches; at Memphis, 55; Cairo, 47; St. Louis, 38; Dodge City, 20; Denver, 17; Prescott, Ariz., 14; Winnemuca, Nev., 8; Yuma, Ariz., 2; Sacramento, 22; San Francisco, 24. The comparative cloudiness, per cent. of time the sky is cloudy, is, at St. Louis, 52; Dodge City, 38; Denver, 38; Santa Fé, 37; Prescott, 24. Owing chiefly to local causes there is a slight difference in the rainfall and per cent of cloudiness in different portions of these dry regions. More rain and snow are precipitated in the high than low regions, as indicated by the distribution of vegetation, as well as by the actual record of inches of precipitation. The atmosphere is also more humid and the sky more cloudy on the windward than on the leeward side of mountains standing across the path of rain-bearing winds, so also valleys are damper than open countries of the same level, and valleys running north and south are more likely to be damper than those running east and west where both sides of the valley are exposed to the rays of the sun. Of all this vast high and dry region Colorado and New Mexico stand unrivalled in their claims for suitable climates for consumptives.

Colorado enjoys the distinction of having the highest general altitude of any of these extremely high and dry States. It also enjoys the distinction of having embraced within its borders several thousand square miles of the highest plains. Denver, standing on the extreme western margin of the great plains, 5294 feet above the sea, may be considered to fairly represent the climate of Colorado. Here the annual average rainfall is 15 inches; average temperature, 49°; the mean daily range of temperature, 24°; mean monthly range of temperature, 59°; mean monthly movement of wind, 4580 miles.

Perhaps better results are obtained from a larger number of properly selected tuberculous subjects at Denver and at Colorado Springs, a little further south, than at any other places in the United States, if not in the world. But unfortunately many cases are unable to endure the winds and extreme daily variation in the temperature, as is evidenced by the large class of unsuitable cases indicated by the most enthusiastic advocates of this climate, and by the many unfavorable reports of cases who have tried it without benefit, and who afterward were greatly benefited or entirely cured in less high, cold,

variable climates. But in avoiding such extremes the fatal mistake should not be made of selecting warmer and moister localities, but rather warmer but still high and dry localities should be selected. Colorado Springs is a little further south than Denver and possesses some advantages over the latter place in having some protection from the wind ; and the parks and plateaus and deep canons further west possess some advantages, especially in winter, over either Denver or Colorado Springs.

New Mexico possesses many advantages over Colorado, in that it has about the same high altitude and cold variable climate in the northern portion of the State as Colorado and a much lower altitude and warmer climate in the southern portion of the State. Taken as a whole, it is one of the dryest, if not the very dryest State in the Union. The annual average rainfall does not exceed 10 to 12 inches. On an average not more than 25 or 30 cloudy days are recorded during the whole year. At Santa Fé the average annual temperature is 48° ; mean daily range of temperature, 34° ; average annual rainfall, 14 inches. At La Mesilla, in the extreme southern part of the State, the annual average temperature is 63° ; the main daily range of temperature, 34° ; the average annual rainfall, 8 inches. The Rio Grande River falls 3500 feet from the time it enters the northern till it leaves the southern border into Mexico. On account of this difference in the altitude and temperature of different portions of the State many patients, who would be excluded from Colorado and Northern New Mexico, can do well, especially during the winter season, in extreme Northwestern Texas, about El Paso, 3800 feet above the sea, and at various points in the Pecos Valley in Eastern New Mexico, at Seldon or La Mesilla, 4000 to 7000 feet above the sea, in Southern New Mexico, or in the vicinity of Silver City in Southwest New Mexico. Indeed, most patients from southern and temperate climates would do well at one of these places, especially El Paso, Tex., before going to the higher and cooler regions of Northern New Mexico or Colorado. Southeast of Silver City stretches a beautiful plateau 50 miles long by 40 miles wide, itself 4000 to 5000 feet above the sea, and almost surrounded by mountain ranges and peaks which shelter it from disagreeable winds. From

here the patients, if desired, can go by degrees to the higher, colder climate of Northern New Mexico, or even to Colorado. But Santa Fé or Las Vegas Hot Springs will furnish about all the good there is to be found in such high, dry, cold climates. In no part of the State does vegetation rot, but dries up; meats do not decompose, on account of the absence of moisture. Asthma and hay-fever are unknown among the natives, and a vast majority of cases of incipient tuberculosis are cured entirely by a sojourn here of from six months to three years.

Eastern Arizona possesses many of the advantages of New Mexico, but toward the south and west the elevation above the sea is only slight, and the climate is too warm to be agreeable. Many localities west of the Sierra Nevadas, Santa Barbara, Los Angeles, San Diego, and Pasadena are noted health resorts. Many favorable reports of results come from this region, especially from localities at high elevations, but it is generally conceded that better results are obtained at the inland than at the coast resorts. While good results are obtained in Wyoming and Utah, and even in Montana, and still farther east and south on the plains, yet Colorado and New Mexico, especially the latter, and still more especially extreme Northwestern Texas and Southern and Western New Mexico possess the most advantages for tuberculous subjects.

The chief claim for the latter places are, (*a*) that they possess positively curative influences nearly or quite equal to that of the climate of higher and colder regions without many of their objectionable features; (*b*) many patients included in the unsuitable list for the higher bear the climate of these lower regions well, and often recover after a sojourn here of from six months to three years; (*c*) fewer mistakes are likely to be made in sending promiscuously cases there than to places with such a large list of exclusions. The most suitable American climate may be included in the nine degrees lying between the 31st and 40th parallels north latitude and the nine degrees lying between the 101st and 110th meridian west longitude.

The principal disadvantages of these lower regions are the rapidly moving waves of wind and the large amount of sand that gathers and floats with these winds. But these winds

are no worse, and, except at certain seasons, are not even so severe as in Colorado ; the changes in the temperature are not more sudden, and are not even so severe as in Colorado, besides cyclones seldom or never occur there. Sand is not so bad, except in large towns and in cultivated districts exposed to the winds, while most of the health resorts are protected by hills and mountains from the winds and their accompanying sand, and consequently have less to contend with from those evils.

As a general rule, persons suffering from valvular lesions, rapid action of the heart, emphysema, penumonia, pneumohydrothorax, "existing hemoptysis," advancing bronchectasis, hypersensibility of the nervous system, double cavities, pyrexia, great debility or advanced age, should not go to the higher altitudes. Yet many such persons do well in the highest, coldest portions of the central Rocky Mountain regions, but many of these will do better in the lower, warmer, drier sections referred to. Unless hemoptysis actually exists such cases usually do well at moderately high altitudes, from the fact that the conditions which give rise to hemoptysis are rapidly relieved. Many cases of valvular disease and many cases of apparently hopeless pulmonary tuberculosis do well at high altitudes, yet great care should be exercised in the selection of such cases. But cases of incipient tuberculosis do the best, and from this class most recoveries are recorded. Patients with constant, continued fever, great debility, and advanced age should strictly avoid high altitudes.—*American Practitioner and News, October*, 1895.

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EFFECTUAL TREATMENT FOR ACUTE ALCOHOLISM.—A young wife had just settled in her new home. All seemed fair and promising, but one night her husband came home very late and staggered into the house. His wife was greatly shocked, told him he was ill and to lie down at once. He did so. His face was reddish-purple, his breathing heavy, and altogether he was a pitiable-looking object. Mustard plasters were applied to his hands and feet. When the doctor came, felt his pulse, examined him, and found that he was drunk, he said :

" He will be all right in the morning "

But the wife insisted that he was very ill and severe remedies must be used.

" You must shave his head and apply blisters," she urged, " or I shall send for some one who will."

His head was accordingly shaved closely and blisters applied. All night he lay in a drunken sleep, notwithstanding the blisters.

About daylight he awoke to a most uncomfortable consciousness of blistered agonies.

" What does this mean?" he said, putting his hand to his bandaged head.

" Lie still; you mustn't stir," said the wife. " You have been very ill."

" I'm not ill."

" Oh, yes, you are; you have brain-fever. We have worked hard with you all night."

" I should think you had," groaned the victim. " What's the matter with my feet?"

" They are blistered."

" I'm better now. Take off the blisters; do," he pleaded, piteously.

He was most uncomfortable; his head covered with sores and his hands and feet still worse.

" My dear," he said, groaning, " if I should get sick in this way again, do not be alarmed or send for a doctor, and, above all, do not blister me again."

" Oh, indeed, I will. All that saved you was the blisters; and if you should have another spell, I should be more frightened than ever, for the tendency, I am sure, is to apoplexy; and from the next attack you will be likely to die unless the severest measures are used."

From that day he has not had another attack of drink (Dover " Journal-Annals Hygiene").—*Journal of Practical Medicine.*

# FOOD INFECTION WITH TOXICOGENIC GERMS.

By VICTOR C. VAUGHAN, M.D., Professor of Hygiene and Dean of the Department of Medicine and Surgery in Michigan University, and GEORGE D. PERKINS, M.D., of Ann Arbor, Mich.

WITHIN recent years there has apparently been a great increase in the number of instances of food poisoning. This increase has been partly real and partly only apparent. The actual increase has been due to the larger consumption of preserved foods and the wider distribution of food from a given point. When we recognize the facts that the scientific principles of bacteriology are involved in the preparation of every can of preserved food and that this work is done wholly by those who are grossly ignorant of these principles, we can only wonder that harm does not come to the consumer more frequently than it does. Moreover, diseased and damaged articles of food can be worked in preserved preparations and sold as prime goods when they could not be so disposed of otherwise. We do not claim that this is a fraud frequently practised, but that it has been occasionally resorted to both in this country and in Europe has been abundantly demonstrated.

It is not our purpose in this paper to discuss the use of tuberculous meat and milk or of any other food invaded by specific infection ; but we wish to give our attention to those cases of food poisoning in which the infecting agent is a saprophytic poison-producing micro-organism.

The apparent increase in the number of instances of this kind is due to the fact that the medical profession has but recently learned to recognize this form of food infection as a cause of illness, or, at least, has been in the possession of the knowledge necessary to convert suspicion into demonstration. Only a few years ago we were seeking for the cause of the summer diarrhœas of infancy in mysterious telluric and meteorologic conditions, but now we know that these diseases are solely due to infected, and consequently poisonous, food. Formerly many cases of food poisoning were supposed to be due to the accidental or criminal addition of some metallic or

vegetable poison to the food, and unjust accusation, possibly in some instances unjust punishment, has resulted. Now we know that not only the symptoms of gastro-intestinal irritant, inorganic poisons, but those of typhoid-fever and typhus-fever, scarlet-fever, and other acute exanthemata, and even those of pneumonia, may be closely simulated by the symptoms induced by infected foods.

The effects of poisonous foods as gastro-intestinal irritants are too well known to demand illustrative examples. The production of a continued fever closely simulating typhoid has been repeatedly observed. The following brief abstract of a case reported by Gaffky will serve as an illustration :

D., the chemist of the Hygienic Institute at Giessen, did not feel well on the morning of October 10th, but in company with assistant B. he visited Frankfort. During the day he had a severe headache, no appetite, and frequent chilly sensations. On returning to Giessen at night he was scarcely able to walk. On the next day he refused all food, was slightly delirious, and had one watery stool. On the 13th his condition showed serious infection. His face was red, his eyes sunken, his temperature 105.2°, and he lay in a half unconscious state. The tongue was heavily coated ; the abdomen distended and painful on pressure. He had five dark-brown, later greenish, stools. The urine was concentrated and contained 2 per cent of albumen, as determined by Esbach tubes ; it gave the diazo-reaction and the indican-reaction and contained white blood corpuscles and numerous granular casts.

From the 13th to the 17th the patient was stupid, but not delirious. The abdomen was greatly distended, and from 20 to 24 stools were passed each day with great tenesmus. The temperature remained high notwithstanding repeated one-gram doses of antipyrin. Sleep was broken and one gram of sulfonal was given at night. The urine remained as before, and the pulse varied from 92 to 100.

From the 18th to the 20th the mental dulness was less marked. Appetite was somewhat improved and the number of stools decreased from 8 to 10 in 24 hours. The amount of albumen in the urine was somewhat decreased and microscopic examination showed fatty casts and white blood corpuscles. Small doses of opium were given by mouth and in suppositories.

On the morning of the 21st hemorrhage from the bowels, about 300 c.c. in amount, occurred. Several doses of opium were given and ice bags were kept on the abdomen. After the hemorrhage there were three slightly bloody stools. From

this time the improvement was slow, but fairly constant. The fever disappeared October 29th.

After recovery, marked anæsthesia of the anterior surface of the thigh developed and remained for some weeks, the anæsthetic area gradually becoming smaller. The hair fell out, mental activity tired, and the eyes were easily fatigued for some months. Two workers in the same laboratory were affected in the same manner, but less severely. The only food or drink which these three men had in common was some uncooked milk taken on the morning of October 9th. D. ordered the milk sent to the laboratory, drank the greater part of it himself, giving B. a small cupful, and the servant drank a little left by the others. The cow that gave this milk was suffering from a bloody diarrhœa. Gaffky found in the stools of the cow and in those of the patients a small highly virulent form of the bacillus coli, and to this he ascribes the ill effects. He supposes that some of the liquid discharges from the cow fell on the udder and thus found its way into the milk.

Gaffky suggests that the epidemic in Christiania in 1888, in which 6000 persons sickened within three weeks, was probably due to milk infection. Hausemann states that this epidemic was regarded as *morbus sui generis*. It was evidently neither cholera nor typhoid-fever. Half of those affected were children, and yet nurslings escaped altogether. However, milk, as an etiologic factor, seems not to have been considered by the attending physicians.

A case of food poisoning resembling scarlet-fever was seen by one of us two years ago and may be briefly reported as follows :

K., a very vigorous man of thirty-four, ate freely of canned salmon. Others at the table with him remarked that the taste of the salmon was peculiar and refrained from eating it. Twelve hours later K. began to suffer from nausea, vomiting, and a griping pain in the abdomen. Eighteen hours after he had eaten the fish. Dr. Vaughan saw him. He was vomiting small quantities of mucus, colored with bile, at frequent intervals. The bowels had not moved and the griping pain continued. He was covered with a scarlatinous rash from head to foot. His pulse was 140, temperature 102°, and respiration shallow and irregular. The stomach and large intestines were washed out thoroughly, and ten grains of calomel, soon followed by twelve ounces of solution of magnesium citrate, were administered, for the purpose of cleansing the small intestines. After these medicines had acted freely, K. began to improve. The next day the rash had disappeared, but the

temperature remained above the normal for four or five days, and it was not until a week later that he was able to leave his house. The remainder of the salmon was submitted to various tests. The absence of inorganic poisons was demonstrated. It was found that the subcutaneous injection of twenty drops of the fluid expressed from the salmon caused evident illness and suffering in a white rat. The only germ that could be found either by direct microscopic examination or by the preparation of plate cultures was a micrococcus, and this was present in the salmon in great numbers. This germ grew fairly well in beef tea, but the injection of five c.cm. of beef tea cultures of different ages failed to affect white rats, kittens, or rabbits. However, this micrococcus, when grown for twenty days in a sterilized egg, after Hueppe's method of anaerobic culture, produced a most potent poison. The white of the egg became thin, watery, markedly alkaline, and ten drops sufficed to kill white rats.

The resemblance of the symptoms of food-poisoning in some instances to epidemic pneumonia is well illustrated in the Middlesborough pneumonia epidemic which has been reported by Ballard and is too well known to require further mention, except to state that 490 deaths resulted.

That Winckel's disease, a septic pneumonia, may be due to infection of the food with the bacillus enteritidis first discovered by Gärtner in poisonous meat has been demonstrated. Lubarsch has reported such a case in an infant.

The stools were greenish and of bad odor. The child became cyanotic and the respiration increased to 60 per minute. Auscultation and percussion were negative in results. The breathing was wholly costal and the abdomen distended. The urine contained neither albumen nor hemoglobin. Post-mortem examination showed pneumonia of the left lower lobe, bilateral purulent bronchitis, atelectasis of the right lung, parenchymatous cloudiness of the kidneys, fatty infiltration and engorgement of the liver, and slightly enlarged spleen. All other pathologic conditions were believed to be consequent upon the septic pneumonia. Plates made from the diseased organs developed only the bacillus enteritidis.

It is quite impossible to draw any sharp line between intoxication and infection in the study of the symptoms of food poisoning. Some of the bacterial poisons are slow in inducing their effects, and even when a germ-free preparation is used in our experiments upon animals, it sometimes happens that many hours elapse before any effects are observed, even

in cases ultimately terminating fatally. The relation of the germ to the production of the untoward symptoms may, according to the case, be stated in one or the other of the following ways: (1) The chemic poison is generated only and wholly in the food before it is taken; (2) the infecting organism may begin the elaboration of its poisonous products outside, and continue the same within, the body; (3) the infection may not result in the production of poisons until the food is taken into the body. The first of these conditions is well illustrated by the "Iron Bridge" cases reported by Ballard. The infecting germ would not grow at a temperature above 86°. Of course animal inoculations with this germ were wholly without result, but cultures grown at 60° were markedly poisonous. It is probable that this condition holds good in a larger number of instances than we suspect. The second condition is the one existing in some cases of poisoning with milk and its products. However, in these the infecting micro-organisms do not thrive in the body unless they be supplied with the food especially suited for them. The complete withdrawal of milk as a food leads to their speedy disappearance. The violent vomiting and purging which result are curative means and should not be checked unless there be danger of death from exhaustion. The most dangerous cases of cheese-poisoning are those in which vomiting and purging do not occur. Some months ago one of us saw some twenty persons who had been poisoned with cream. All but two were vomiting and purging and complaining most vehemently. These were sure that they would die. The two exceptional ones were uttering no complaints. In fact, they were practically comatose, and thorough washing out of the stomach and intestines was resorted to before they realized that they were in danger.

When the third condition mentioned exists, a true infection results. Such is the case most probably in those instances already cited as resembling typhoid-fever and pneumonia.

We have been frequently called upon to examine food suspected of having caused untoward effects, and the method followed in these examinations may be of some interest. Whenever there is the slightest possibility that a metallic poison may be present, tests for the same are made. This is

always done with canned foods. However, when a teaspoonful or less of ice cream causes vomiting and purging, the idea that these effects can be due to zinc sulphate dissolved in the freezer or to artificially prepared vanillin used in flavoring is simply too preposterous to be entertained by any one acquainted with the quantities of these substances necessary to induce such effects. Ten years ago we went through with all the tests for metallic poisons in many samples of poisonous cheese and ice cream, but we no longer waste our time in this manner.

The examination of foods for bacterial poisons cannot be made except in a properly equipped bacteriologic laboratory. It is our purpose to merely point out at this time the methods that may be followed. We take it for granted that the one who undertakes work of this kind is already familiar with the ordinary technic of bacteriologic research. The line of procedure will vary somewhat with the kind of food to be examined, the form in which it has been prepared, and the quantity supplied the analyst. All samples should be examined with as little delay as possible after the article has become the object of suspicion. When delay is unavoidable, further bacterial growth should be retarded in the mean time as far as is possible by keeping the suspected article at a low temperature. Germs not present at the time of the supposed poisoning may be accidentally introduced, or non-toxicogenic bacteria may multiply to such an extent that the detection of the harmful organisms is rendered impossible.

As a rule, the quantity of the food supplied the analyst is not sufficient to allow of the detection or the isolation of the chemic poison directly. To try to find the poison in a few ounces of cheese or a small bit of meat by direct extraction is a task that would be undertaken only by one quite ignorant of the nature of these poisons. In all but exceptional instances in which many pounds of the food are supplied, the portion that reaches the laboratory can only be regarded as the bearer of the germ to the activity of which the poison is due. This germ must be detected, isolated, grown in pure culture, and its toxicogenic properties demonstrated upon lower animals. It should be clearly understood that the most thorough study of the morphologic characteristics of the germ

and of the chemic properties of the poison will not suffice without an accompanying determination of the toxicologic action of the cultures. The infectious nature of the bacterium should also be studied.

It should always be borne in mind that the article of food has probably been through several hands before reaching the analyst, some of which may not have been germ-free. In the examination of pieces of meat and cheese, the surface should be sterilized with a broad, heated knife or other piece of iron. It has been shown that bacteria deposited on such surfaces penetrate slowly. Then with other sterilized knives sections should be made and one or more small bits taken from the interior should be placed in sterilized bouillon. Not less than a dozen tubes should be inoculated in this way. Three of these should be grown aerobically at ordinary temperature; three anaerobically at the same temperature; three aerobically at 37° C.; and three anaerobically at 37° C. It is quite essential that all these conditions of growth should be tried. Some of the toxicogenic germs grow best at relatively low temperature, from 20° to 25° C., and fail wholly to develop at 37° C. Others have their optimum growth at the last-mentioned temperature. Some develop only when freely supplied with air, and others only when the air is excluded.

In the examination of liquid and semi-liquid foods, such as milk, custard, cream, broths, and jellies, small bits or a few drops should be placed in sterilized bouillon and grown under the conditions already mentioned.

A growth having appeared in one or more of these tubes, the bacteria should be examined in hanging drops and in stained mounts. If more than one organism be present, plate cultures should be made and each germ should again be grown under the conditions mentioned.

The infectious character of each organism should be tested on the lower animals: (1) by feeding; (2) by subcutaneous inoculation; (3) by intraperitoneal inoculation; and (4) by intravenous inoculation. The animals generally employed in these experiments are white mice, white rats, guinea pigs, kittens, and rabbits. A given germ may be toxicogenic to one of these animals and not to the others. Mice and kittens

are specially suitable for feeding experiments. Young kittens are quite susceptible to most of the bacterial poisons found in milk and its products. The quantity of the bouillon culture, twenty-four hours old or older, first employed should be relatively large, from one to ten c.cm., according to the animal and the method of infection. If these amounts prove active, smaller quantities should be tried until the limit is reached.

Next, the action of cultures from which the bacteria have been removed by filtration through porcelain should be tested, and, if these prove active, the effect of different degrees of heat on the toxicity of the cultures should be determined.

If by the experiments already mentioned a toxicogenic germ has been discovered, its morphologic, cultural, tinctorial, and pathogenic properties may be studied as thoroughly as the investigator may desire. The study of the bacterial poison may also be carried to the same extent.

The following reports are taken as illustrations of the results obtained by the method given :

December 31st, 1894, Dr. Traver, of Somerset, Mich., was called to see the family of Mr. Van Allen. He found the father, mother, and two children suffering from protracted vomiting and marked exhaustion. There was no fever and no diarrhœa. Tyrotoxicon poisoning was suspected, but inquiry showed that their supper had consisted of bread, butter, tea, dried beef, and raspberry sauce. There was nothing in the appearance or odor of the meat to cause any suspicion. In fact, it seemed to be of exceptionally good quality. Anaerobic cultures from the interior of the meat were made and developed a bacillus, from two to three times as long as broad, taking the ordinary stains well, motile, with no spore formation, not liquefying gelatin, but coagulating milk, growing best at the temperature of the body, but developing its poison at ordinary temperature, producing gas abundantly, and pathogenic to white rats, rabbits, and guinea pigs. Sterilized cultures were also poisonous.

Of a large number of men at a banquet at Sturgis, Mich., April 26th, 1894, every one who ate of the pressed chicken served was made sick. Some who were not at the banquet, but who aided in preparing for it, ate small bits of the chicken, and were also sick. All were attacked, within from two to four hours after eating the chicken, with nausea, violent griping, and purging ; many fainted while attempting to arise from bed.

The chickens were killed Tuesday afternoon, picked and

left hanging in the market-room (not in a cooling room) until Wednesday forenoon, when they were drawn and carried to a restaurant and here left in a warm room until Thursday morning, when they were cooked (not very thoroughly), pressed, and served at the banquet that night. Those who ate of the unpressed chicken were also made ill.

The pressed chicken contained two micro-organisms, a slender bacillus, from four to five times as long as broad, and a streptococcus. The bacillus was fatal to white rats, guinea pigs, and rabbits when administered intraperitoneally, intravenously, and subcutaneously. The streptococcus was not fatal when given in pure cultures, but mixed cultures of the two induced death, and in these instances, when administered subcutaneously, in addition to the lesions formed after the employment of pure cultures of the bacillus, there was extensive sloughing. This bacillus is motile, takes the ordinary stains readily, and is decolorized by Gram's method. It grows very slowly at ordinary temperature and rapidly at 98° F. Of two cultures of equal age, one grown at ordinary temperature and the other at 98° F., one c.cm. of the former was necessary to induce death, while one fourth c.cm. of the other proved fatal. The anaerobic cultures were much more powerful than the aerobic. On gelatin plates exposed to the air the growth was slow, while on those kept in an atmosphere of hydrogen it was much more rapid. Spores could not be detected. The bacillus coagulates milk and decolorizes litmus gelatin. On potatoes it forms a dirty, thick, slimy growth. It does not liquefy gelatin and the production of gas was not observed. Streaks on agar-agar are yellowish white, slimy, and with but little tendency to spread. One half c.cm. of a beef-tea culture heated to 140° F. for thirty minutes killed guinea pigs. One c.cm. heated to 212° F. for fifteen minutes failed to kill. Animals inoculated by the methods mentioned showed evidences of abdominal pain within from one to two hours and several were found dead after twelve hours. The abdominal cavity was found filled with a clear fluid, the blood vessels were much congested, and the peritoneum inflamed. In some instances a bloody fluid was found in the pleural cavity.—*Medical News, November 10th*, 1895.

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LIBEL.—A malicious publication by writing, printing, pictury, effigy, sign, or otherwise than by mere speech, which exposes any living person, or the memory of any person deceased, to hatred, contempt, ridicule, or obloquy, or which causes or tends to cause any person to be shunned or avoided, or which has a tendency to injure any person, corporation, or association of persons in his or their business or occupation, is a libel.

# BEHRING'S DIPHTHERIA SERUM.*

By F. J. B. CORDEIRO, P. A. Surgeon, U. S. Navy.

DIPHTHERIA is generally accepted to-day as being of bacterial origin. One set of bacteriologists insist that the Löffler bacillus is the sole and only cause; another set that the streptococci, staphylococci, and micrococci that are so often observed stand also in the causative relation. Chaillou and Martin† found in 64 cases that presented the typical clinical picture of diphtheria the following:

| | Cases. | Deaths. | Mortality. |
|---|---|---|---|
| | | | Per Cent. |
| Löffler bacillus | 33 | 26 | 78 |
| Löffler bacillus and staphylococci | 5 | 3 | 60 |
| Small cocci | 10 | 4 | 40 |
| Streptococci | 16 | 12 | 75 |

Löffler bacillus in 60 per cent of the cases. In another set of 99 cases of angina, with diphtheritic deposit, the same authors found the Löffler bacillus 71 times = 70 per cent.

Baginsky found in 93 cases of diphtheria the Löffler bacillus 68 times = 73 per cent. In another set of 154 cases given by Baginsky the bacillus was present in 118 = 76 per cent.

It is probable that on an average in about 70 per cent of the cases of clinical diphtheria will the Löffler bacillus be found. This has led to the following bacteriological distinction: those cases in which the Löffler bacillus is found are spoken of as genuine diphtheria; those cases in which this bacillus is not found are called diphtheroid. Clinically there is no distinction, and confusion may easily result, and has already resulted, in comparing the statistics

* Abstract of Report to the Bureau of Medicine and Surgery, Navy Department.

† Chaillon et Martin, Étude clinique et bactériologique sur la diph., Annales de l'Institut Pasteur, 1894, No. 7.

of a former period when no such distinction was made with those of the present time. Escherich* says: "Starting from the fact known to Bretonneau, that we can produce fibrinous membranes in the tracheas of rabbits by making them breathe ammonia fumes, one was led to believe that a very severe inflammatory process could be caused by atmospherical influences. For the majority of cases, however, we must fall back on bacteria as the originators of the disease, and bacteriological investigations have shown that besides the Löffler bacillus there are others that by their growth in the mucous membrane can produce membranous inflammation. In fact, Martin has described cases of croup both primarily laryngeal as well as secondarily, in which the Löffler bacillus during the whole sickness could not be found, but instead a small coccus."

Concetti† says: "Besides the genuine diphtheria produced by the Löffler bacillus there are other forms which present the same clinical and pathologico-anatomical picture as well as gland swellings, albuminuria, and paralyses. The conception of diphtheria cannnot therefore be a simple one, but numerous different factors must be accepted as going to make up the pathologico-anatomical picture.

"Streptococci alone can produce this result. They are associated often with the Löffler bacillus and other micro-organisms and working together present a terrible picture with the character of septicæmia."

Diphtheria in men can be transferred to animals by scarifying and then rubbing in pieces of diphtheritic membrane. The micro-organisms take root and form a kind of fibrinous exudation which never leads to the death of the animals by suffocation. The poisons generated by the bacteria are soon absorbed and eventually lead to the death of the animal from paralysis, sepsis, etc.

If a pure culture of Löffler's bacilli alone is used, that part of the story which belongs to this peculiar bacillus is carried out. Thin fibrinous exudates are formed and death by poisoning results in due time.

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* Escherich: Diphtherie, Croup, Serumtherapie, S. 64.

† XI. International Congress, Rome. Section for children's diseases.

If the pure toxine of the Löffler bacillus is used, which is obtained by filtering a two-days-old alkaline bouillon culture, no fibrinous inflammation follows, but the animal dies simply with symptoms of poisoning—paralysis, parenchymatous inflammation, etc. It is with such toxine that horses are immunized with a view to procuring a serum. The strength of the toxine is tested on guinea pigs; 0.02 cc. of a strong toxine will kill a 500-gram guinea pig in about forty-eight hours. It may be necessary to begin the immunizing process with doses of 0.001 cc., which is gradually worked up to 100 cc.

The testing of the serum is done in the following way: Five guinea pigs of about medium weight are injected with the following quantities of the serum: No. 1 with 0.2 cc., No. 2 with 0.1 cc., No. 3 with 0.08 cc., No. 4 with 0 06 cc., No. 5, the control animal, is not injected at all. A short time afterward, six to twenty-four hours, they are all given 0.02 cc. of toxine subcutaneously, a dose which previous experiment has shown will kill a guinea pig of medium weight in about forty-eight hours. The following results then are noted: No. 5 dies in two days; No. 3 and No. 4 die a little later; No. 2 becomes sick, but survives; No. 1 is only slightly sick. 0.1 cc. of the serum therefore overcomes 0.02 of the poison, and a measure of its strength is thus furnished. Much more would be required to save the animal if the antitoxine were given after the toxine. Kitasato and Behring, in the case of tetanus, found that this increased in an extremely rapid proportion to the time. The unit of serum strength is taken always from an immunizing dose—*i.e.*, the strength is measured as above by giving the serum first and the toxine afterward. Ehrlich and Behring found that for tetanus ten times a minimum killing dose required ten times the immunizing dose of serum. I can find no record of such experiments with regard to diphtheria, and therefore suppose it has been assumed from the tetanus experiments. I cannot find any extended experiments, either, in the case where the poisonous dose is relatively large. It is possible that it may be found that a simple proportional law does not hold in such cases. For instance, if 0.1 cc. of the serum can antagonize 0.02 cc. of the toxine, it may not follow that 10 cc. can antagonize 2 cc. of the toxine, and the proportion may change

again vastly when we attempt to antagonize the toxine after it has been given first. When we read on the label, therefore, of the Höchst serum, 600, 1000, 1500 immunizing units, we must not attach to such figures the same significance as when reading of a current of so many ampères, because our guinea pigs are very uncertain metres, and the proportional law of which we have spoken above may not be true.

It is rather odd, but the serum of the highly immunized animals is a good culture medium for the Löffler bacilli, and the mucous membranes of such animals will allow colonies of the bacilli to grow as readily as those of the unimmunized.* The only published experiment that I can find on the influence of the serum on artificially formed membranes are a few by Roux and Martin, who inoculated the mucous membranes of guinea pigs with a pure culture of Löffler bacilli and at the same time gave them a subcutaneous dose of antitoxine. The bacilli grew and fibrous membranes were formed, but no toxic symptoms were observed. This is of great importance clinically. In animal experiments the serum may preserve a life, because even though the membrane building goes on an animal never suffocates, while in a human being the danger of suffocation from an extension of the membranes is always at hand, and from the above it would seem that the serum has no effect on the membrane building. Let us see what facts we can collect clinically on this point:

Von Roncke (Munich) reports in a fatal case that "25 cc. of antitoxine in four doses after twenty-two days still left traces of the diphtheritic process."

Again, Von Rancke saw partial loosening of the membranes after several days, but remarked the formation of fresh membranes in spite of preceding injections of serum.

Godfroy, Saw, Walker, and Bokar say that the membranes vanished rapidly under the serum treatment, but the cases they report are few.

Voswinkel says that he could see nothing of an earlier loosening of the membranes.

Körte in most of his cases saw no influence on the local process.

* Roux and Martin: Annales de l'Institut Pasteur, September, 1894, No. 9.

Hilbert saw no difference from the serum treatment.

Gallotti observed the separation of the membranes exactly as formerly.

Bender (Berlin) could see no sign of a specific healing influence on the membranes.

The following observers report a large number of cases where the local process increased or renewed itself in spite of serum injections: Rumpff, Sigel, Mendel and Katz, Weibgen, Kassowitz.

Gnändinger reports a case where, after having separated, the membrane renewed itself, and another where, in spite of the injections, the membranes kept spreading.

From the cases which I have observed I cannot notice any perceptible difference in the behavior of the membranes after the serum treatment. As before, in some cases they separate more or less slowly, in others remain stationary, and still in others grow worse.

The claim is made by Behring and his co-workers that the serum stops the spread of the membranes. The burden of proof lies with them then, and one case to the contrary carries more weight against this assertion than a dozen favorable cases.

The fact remains, then, that in spite of the serum treatment a large number of deaths are due to suffocation. It may be or it may not be that the toxine is to a certain extent combatted by the serum, but a far more potent poison than any toxine is here at work—namely, carbonic dioxide. The strongest dose of the strongest toxine will only kill a guinea pig after many hours, while a minute or two suffices after its larynx is plugged to suffocate it. In a human being, and especially in a child, the calibre of the larynx and trachea is but very little more than the necessary minimum for the free supply of oxygen. Let this calibre be ever so little encroached upon and a struggle immediately ensues which cannot last long without exhausting, on the one hand, from the increased muscular effort called forth in breathing, and, on the other, from the gradual piling up of carbonic acid and other impurities.

Let us next consider from what we have learned of the serum from our animal experiments what we may reasonably

expect of it when we transfer our experiments to human beings stricken with diphtheria in its clinical sense. Let us suppose a hundred cases of average diphtheria and consider what we may expect to work in these hundred cases with our serum. In the average, as about 70 per cent of all clinical cases show on examination Löffler's bacillus, we may consider that in 70 of these cases the bacillus is found and in 30 is absent. Only 70 cases, therefore, are available for our serum experiments. Let us suppose that the cases are treated by ordinary methods. The cases are of average severity, and we have a mortality of, say, 30 per cent. Of the 30 dead only 21 show the Löffler bacillus. From our previous tables we have seen that the deaths which can be ascribed to the toxine of the Löffler bacillus vary from one thirteenth to one sixth of the whole. To make the case as favorable as possible, let us take the greater fraction, one sixth. Of the 21 fatal cases which concern us, about 3, say, could have been saved by the antitoxine. The antitoxine treatment, then, would have shown a mortality of 27 per cent instead of 30 per cent. That is supposing that our 1000 or 1500 immunizing units really could resist not merely 0.02 c.c. of toxine, as in our animal experiments, but possibly 20 grams. A grave doubt exists whether or not the antitoxine when injected into the human being really antagonizes in part or at all the working of the toxine. These doubts are founded on the frequency with which post-diphtheritic paralyses are met after the use of the serum ; so frequent, in fact, that Escherich, an advocate of the serum treatment, says that these paralyses occur oftener after its use than before. Here is a symptom considered on all sides as peculiarly due to the toxine of the Löffler bacillus, which, if the serum were an antitoxine in its real sense, it should be able to combat, but over which it is powerless. With a possible, not probable, betterment of 3 per cent from *à priori* considerations, let us see how this agrees with Behring's statement.

Behring said publicly in Vienna : " We now have it in hand to lower the mortality from diphtheria to a tenth of what it is at present, and by combining serum therapy with vaccination to save to their families and to the State countless lives."

Let us consider next the immunizing properties of the

serum. We have here to deal with observations of such a character that one positive result outweighs a hundred negative. For instance, suppose that 100 persons are injected after having come into more or less close contact with diphtheria, and that none of them come down with the disease. This is a negative result. There is no way of determining whether or not such a result would not have happened without the serum. In fact we know from experience that contact with the most contagious diseases often does not reproduce them. But suppose that after carefully protecting a person with 1000 or more immunization units, after every precaution has been taken the individual comes down with diphtheria, in such a case we have more food for reflection than in the hundred cases mentioned above. Suppose we could cite one or two cases like the latter in regard to vaccination for small-pox, how long would such vaccination continue to be practised?

But for the antitoxine we can cite hundreds of cases where in spite of serum no immunization has been perceptible for an hour or a day or a week, according to the various limits set by its upholders. Such cases have been reported by Sonnenburg, Strahlmann, Hager, Bokai, Schüler, Hilbert, and others. In the great discussion before the Berlin Medical Society Hansemann gave a whole list of such cases which had been reported to him by practising physicians. Perl (of Serett, Bukowina) reports that out of 67 people who were immunized 13 shortly after came down with diphtheria and 2 died. Then follows a list of diphtheria relapses—cases which have been treated with serum and seem to have recovered, when suddenly the membranes form again. Kossel, Wolff-Lewin (Berlin), Goebel (Hamburg), Gnändinger, and Widerhofer (Wien) have reported such cases. Wolff-Lewin's case was immunized with 600 units of Behring's serum, but a few weeks later took diphtheria, for which large doses of serum were again given, and after recovering took diphtheria again only twelve days later. Widerhofer's case was that of a child that had been treated with serum, relapsed, was treated a second time with serum, and notwithstanding died. Löffler bacillus was demonstrated in all these cases. In view of the above it is difficult to see where the immunizing property of the serum

comes in. Kossel has attempted to explain away these fatal objections, but to the mind trained only to the logic of mathematics and natural science and not deeply versed in metaphysics his reasoning is unintelligible.

We now come to the statistics of the subject, where, as usual, figures are made to prove whatever the writer desires. We may preface the discussion of this subject by stating what is well known to every physician that diphtheria at different times and places is an extremely variable disease in regard to its severity. Its mortality varies from 10 per cent (or even less) to 80 per cent. It is extremely fatal to younger life, chiefly from mechanical reasons, while among older children and adults it is comparatively harmless.

We find the following figures for the serum treatment:

MORTALITY.

| | Per cent. |
|---|---|
| Baginsky gives | 13 |
| Bokai | 14 |
| Washburn | 14 |
| Constantini | 22 |
| Kossel | 23 |
| Widerhofer | 24 |
| Roux, Martin, Chaillou | 26 |
| Körte: | |
| First series | 30 |
| Second series | 36 |
| Gnändinger | 40 |

We have here a range from 13 to 40 per cent. Such results were often met with long before the antitoxine treatment came in; there is nothing at all extraordinary in these figures; they do not speak for the serum as a specific.

At Friedrichshain (Hahn) we have the following figures:

MORTALITY.

| | Per cent. |
|---|---|
| 1888 | 32 |
| 1889 | 34 |
| 1891, 1892, 1893 | 38 |
| 1894, February to November (serum period) | 33 |

These figures are too varied and contain too many different factors to make a further consideration of them of any value. Some of them apply only to diphtheria in a bacteriological point of view—*i.e.*, only those cases where Löffler's bacillus was found are classified. The individual cases themselves vary much in severity. In a series where the light cases form a large proportion of the total cases the mortality must be very low, and that such is probably the fact in regard to some of the figures given above we shall see from what follows. Again, the character of the diphtheria endemic in Berlin, where most of these figures were obtained, has during the past year and winter been admittedly comparatively mild, so that a comparison of this year's figures with those of severer years would lead to error.

Gottstein has shown statistically (and his figures have not been questioned) that, during this last year, when the antitoxine has been so extensively advertised in the papers and the public attention so constantly fixed upon it, the number of cases of diphtheria received in the Berlin hospitals has been almost double that of former years. For instance, for the months of October and November of 1894 there were received 712 cases, while in the corresponding months in 1890 and 1891 there were received, respectively, 328 and 320 cases. There died during these months, however, in 1894 in the Berlin hospitals 131, while during these months in 1891 the deaths were about the same, and in 1890 only 124.

During the year 1894, then (the serum period), while admittedly the character of the endemic was comparatively mild, the number of cases of diphtheria received in the hospitals has been doubled. If this is a fact (and Gottstein's statements have not been denied) the reasons are twofold. First, the advertisement of the serum has led almost every case of sore throat to apply at once for treatment, particularly as one point has been continually harped upon—namely, the necessity for treatment at the very beginning; secondly, as every case of angina, many of them very light, has been systematically examined for the Löffler bacillus, and this has been found often in the lightest as in the severest cases, many cases have been treated with the serum that in other times, when the diagnosis was made clinically, would never have been heard of.

These many different and disturbing factors render the published statistics of the serum treatment untrustworthy. The combination of figures, also, from different hospitals—as in the case of Roux's and Kossel's figures—only increased the confusion.

We have, however, a criterion to appeal to which possesses none of the foregoing objections—the mortality statistics for diphtheria. I shall consider here the mortality tables for Berlin because the serum originated there, was first tried there, and has been in extensive use for a longer time there than in any other city. Experiments were made with the antitoxine in Berlin in the early part of 1893, and at different periods during the year in the Elisabeth-Krankenhaus, in the Charité, and in Moabit. In March of 1894 it was systematically taken up in the Kaiser und Kaiserin Friedrich children's hospital, and with but a single break followed out through the year. From September to the end of the year it has been in general use in Berlin, both in hospital and in private practice. Let us see if the mortality shows any signs of dropping to one tenth of its former figures as Behring promised, or if it has diminished at all.

NUMBER OF DEATHS FROM DIPHTHERIA AND CROUP IN BERLIN.

| | |
|---|---|
| 1881 | 1,593 |
| 1882 | 1,913 |
| 1883 | 2,651 |
| 1884 | 2,446 |
| 1885 | 1,802 |
| 1886 | 1,535 |
| 1887 | 1,304 |
| 1888 | 1,070 |
| 1889 | 1,252 |
| 1890 | 1,549 |
| 1891 | 1,057 |
| 1892 | 1,405 |
| 1893 (serum period) | 1,643 |
| 1894 (serum period) | 1,430 |

The latter two years, during which the serum was introduced, do not show any remarkable diminution in the mor-

tality. It is noticeable that during the period 1882 to 1885 a severe epidemic raged ; outside of this period the mortality does not vary much. We can certainly say that for 1894 the endemic was of an average mild character, and we have no reason to believe that without the serum the mortality would have been different from what it was. The fact stands, then, that from *à priori* considerations we expected a small reduction of the mortality from diphtheria from the use of the serum, but that practically no such reduction is perceptible.

The verdict cannot yet be given that the serum is absolutely without effect upon the mortality from diphtheria, although everything points in that direction. The mortality statistics of another year at least will be needed.

In summing up, then, it will be well to bear in mind the following points which I quote bodily from Kassowitz :*

" 1. A large number of children treated with both small and large immunizing doses have within a few weeks acquired diphtheria, and some of them have died of it. We do not possess a single scientific proof that a case of diphtheria was ever prevented by the immunizing process.

" 2. Children who during a first sickness have been treated with large doses of serum have a short time after acquired diphtheria anew. They were not rendered immune either by their sickness or the largest doses of the antitoxine.

" 3. In a large number of cases children have been treated on the first or second day of their illness with the fullest doses of the antitoxine and have died.

" 4. It is certain that a large part of those who have died, notwithstanding the serum treatment, did not die from the effects of a mixed infection, but directly from the specific effects of the Löffler bacillus.

" 5. Heart and other post-diphtheritic paralyses are also seen in early and fully treated cases, and they occur as often as they did before the serum treatment.

" 6. Of a fever fall by crisis in the first twenty-four hours and of a pronounced antipyretic effect of the serum most observers have seen nothing or next to nothing.

" 7. The separation of the membranes follows in the cases

* Wie steht es mit der Serumbehandlung der Diphtherie. Wien.

that run a favorable course in the customary manner. But often there is an extension of the local process and a renewal of the already separated membranes during and after the serum treatment."

The burden of proof lies with Behring and his co workers. The world will eagerly and only too willingly receive this proof. We know that the former extravagant promises are out of the question, but we should be grateful to have it demonstrated that the serum can reduce the mortality by even 1 per cent. As yet we have not the slightest basis on which to found an expectation that fewer children will die in the future of this disease on account of the serum treatment.—*From Report of the Surgeon-General, U. S. Navy*, 1895.

DIPHTHERIA AND "CROUP."—At a recent discussion of the relation of membranous croup to diphtheria by the St. Louis Medical Society (*Medical Review*, November 16th, 1895), Virchow was cited as authority for their identity. . . . "From a purely clinical standpoint," says the *Review*, "we would, with the present light on the subject of croup and diphtheria, formulate our views to the effect that, whereas in the great majority of those cases which used to be classed as ordinary 'membranous croup' in contradistinction to 'diphtheritic croup,' the diphtheria bacillus has been demonstrated in the local lesions, these should now be classed as cases of diphtheria whenever that bacillus has been shown to be present. In a very small percentage of cases, however, the diphtheria bacillus cannot be demonstrated, and these "may," therefore, be due to other etiological factors. Taking into consideration that in some severe cases of diphtheria the diphtheria bacillus may escape detection on account of a mixed infection, in which it is located deeply in the tissues of the inflammatory foci, it would appear that the cases of what used to be called 'membranous croup,' in which the etiology is doubtful, are exceedingly few. . . .

"The opinion of the majority of authors is drifting in the direction of accepting the diphtheria bacillus as the etiological factor of nearly all cases of 'membranous croup' as well as 'diphtheritic croup.'"

# SEWERAGE AND STREET CLEANING OF VIENNA.*

By MAX JUDD, Consul-General.

THE city ordinance of 1883, which is still in force, prescribing for house sewerage, pipes, or sewers with passageways and the connection of water-closets with the general sewerage system, was made obligatory. The cheapness and cleanliness of pipes led to their being used not only for houses, but also, to quite a large extent, for streets. They are cleansed with water. A vertical pipe is connected with the sewerage pipe, an iron valve separating the two at the point of contact. The vertical pipe is filled to a certain height with water, after which the valve is opened and the water, which enters the sewerage pipe with great force, cleanses it most effectually.

The sewers with passageways are cleaned by hand labor, at night, from four to twelve times yearly when used for street sewage, and once every month when used for house sewage.

The sewage thus obtained, after being gathered into wooden buckets of about 3 cubic metres (106 cubic feet) capacity, is hauled to a steamer, on which it is taken to the junction of the Danube with the Danube Canal, and dumped. The cesspools, which still exist in some of the more sparsely populated parts of the city, are also cleaned by hand labor, the solid matter being carted to the Danube, the fluid being pumped into one of the larger sewers.

In spite of the increase of the population of Vienna, there is a constant decline in the quantity of sewage taken out of the sewers by hand labor. In the year 1880, the quantity thus got rid of was 17.45 litres (18.4 quarts) per inhabitant, and in 1891, only 7.06 litres (7.46 quarts), which decrease is attributed to the development of the general sewerage system and to the increase in the use of the pipes and the cleansing of sewers with water. The cleaning of the sewers, pipes, and cesspools is done by contract, under strict municipal super-

* From report to State Department.

vision, the cost being 2.03 cents per metre (39.37 inches) for cleaning the street sewers, and 1.4 cents per metre for cleaning house sewers.

The water supply is not large enough at present to permit all the sewers to be flushed, but it is being increased with a view to this object.

*Sewerage System.*—The drainage system of Vienna is, on the whole, fairly satisfactory, the street sewers, which are a considerable distance below the streets, being built as far as possible with reference to the draining of the neighboring houses. In such parts of the city as are troubled with standing waters, drainage pipes of porous clay are built beneath the house sewers and connected with the street sewers.

In the year 1850, the various outlying quarters of Vienna were united with the city proper, and their sewerage systems were put directly under the control of the municipal government. In the year 1891 the general sewerage system was extended to the suburbs which were incorporated with the city. This unification of the city led to important improvements in the sewers, which are gradually being united into a comprehensive and satisfactory system.

In the year 1893 a sewer was commenced on the left side of the Danube Canal, which drains the various sewers that emptied within the city limits directly into the canal. This receiving sewer, which is already finished, empties in the canal some distance below the city. It is 6950 metres (7601 yards) long, and has a fall of 0.4%. It has a width of 1.50 metres (5 feet), and a height of 2 metres (6.56 feet) at its commencement and a width of 2.45 metres (8 feet) and a height of 1.90 metres (6.23 feet) at its juncture with the canal. It drains an area of 1130 hectares (2792 acres). The receiving sewer on the right side of the canal, which is not yet finished, will have a length of 12,269 metres (13,418 yards) and a fall of from 0.85% at its commencement to 0.4% at the end. At its commencement, it will have a width of 1.65 metres (5.4 feet) and a height of 1.10 metres (3.6 feet). It will be gradually enlarged to a width of 8.3 metres (27.23 feet) and a height of 3.50 metres (11.5 feet).

In all of the street sewers, a free space, with a minimum width of 0.80 metre (31 inches) and a minimum height of 1.1

metres (39.7 inches) is obligatory, while the usual width is 0.84 metre (34 inches) and the usual height 1.26 metres (49 inches). This is in order that they may be passed through.

Numerous changes have taken place in Vienna in the *manner of constructing sewers.* In the year 1859 the bottom of the sewer was built in the shape of a half circle, the wall consisting of a double thickness of bricks. Since 1872 this form of sewer has been superseded by one in which the half circle is changed into a half ellipse, which extends from the bottom of the sewer to the middle of the free space. The walls then rise perpendicularly from the ellipse to a height equal to one sixth part of the sewer and are finally curved in an arch, in the form of a half circle. The bottoms of the large sewers are either in the form of a segment or an ellipse, and are generally made of Dutch tiles. The bottom is made in the form of a segment, if a considerable flow of water is to pass through the sewer, as it is found that the friction is very great on the bottom, if the latter has the form of an ellipse.

A great advance in the construction of sewers was made when beton was introduced. In the year 1873 a sewer was made of this material, for the first time, and since then it has been employed very generally for street sewers. It is cheaper and has a smoother surface than bricks, besides which, it lasts well and is completely impervious.

Beton is not used when a sewer is near enough the surface of the soil to have its arch affected by frost or the passage of heavy wagons. The sewers made of beton are egg-shaped, the half ellipse in which the lower part of the sewer is shaped being covered by an arch in the form of a half circle. The wall of the upper part of the ellipse is made of one part Portland cement beton to three parts sand, and it is at most only 1 centimetre (0.3937 inch) thick. The sides and bottom of the ellipse consist of one part Roman cement beton and four parts sand. The walls of the half circle, or arch above the ellipse, are made of one part Roman beton to two parts sand and two parts of small pebbles.

*Deodorizers* are not used in Vienna, and the sewage is not made use of for purposes of fertilization, as in Berlin.

*Cost.*—Vienna is an easy city to drain, as on the right side of the canal, where the largest part of its inhabitants live,

there is an average incline of from 10 to 25 per cent. Although its system of sewerage is not as advanced as that of some of the German cities, it is being constantly improved, and is, on the whole, fairly satisfactory.

In the year 1892, $130,291 were spent for building and repairs, while the cleaning of sewers and cesspools cost $140,466.

*House Drainage.*—Of the total population of 1,451,000 at the close of the year 1893, about 1,400,000 lived in houses connected with the general sewerage system which empties into the Danube Canal. One half of the water used daily in Vienna reaches the canal through the sewers. It is estimated that, in dry weather, it takes this water ten hours before it reaches the canal, and that 1.167 cubic metres (37.72 cubic feet) of which 0.027 cubic metre (9½ cubic inches) consisting of the solid refuse from water-closets, are thus got rid of per second.

As the flow of the Danube Canal, at its normal height, is estimated at 177 cubic metres (6056 cubic feet) per second, the solid refuse is diluted 6556 times when it reaches the canal, and when it reaches the Danube, a few miles below the city, it is diluted 50,000 times.

*Decrease in the Death-rate* (condensed from table), 1867, 32.0; 1886, 26.6: annual average for the eight years ending 1886, 30.4—1887, 25.8; 1893, 24.4: annual average for seven years ending 1893, 24.31.

## STREET CLEANING IN VIENNA.

The streets of Vienna are always kept in good condition, for just as soon as the street shows the need of repairing, it is attended to at once.

For the year 1892 the following amounts were expended for street paving and repairing: New streets paved with granite blocks, $152,000; repairing old granite block pavements, $292,000; macadamizing new streets, $35,000; repairing old macadamized streets, $123,830. There were a few streets paved with asphalt, also.

Vienna is divided into nineteen districts, the inner portion —the most important business quarter—being the old part of the city. The plan of Vienna can be best described by comparing it to a wheel, the first district being the hub, and the other eighteen districts the spokes.

The sprinkling of these districts is done very thoroughly and systematically by sprinkling wagons and rubber hose. The rubber hose, which is about 2½ inches in diameter and 400 feet long, is connected with a fire plug, when water is required. After the area in the neighborhood has been sufficiently sprinkled, the hose is rolled on a reel and carried to the next fire plug. The streets are washed in this manner three times daily.

The total amount of money spent for sprinkling an area of 6,031,562 square yards in the year 1892, water being furnished free, was $134,302; 5,097,661 square yards were sprinkled twice a day by wagon, using daily 1,270,065 gallons of water; 933,900 square yards were sprinkled three times a day with rubber hose, using 611,858 gallons of water daily.

Like all large cities on the Continent, Vienna has very clean streets. The method of keeping them in such condition is very simple, and there is no reason why the same results should not be obtained in the United States, if enough money be appropriated, to have the work done properly.

The street-sweeping department is in charge of salaried officers as follows: Inspector, per year, 2100 florins ($842.60); comptroller, per year, 1700 florins ($690.20); office man, 720 florins ($292.32) and lodging; assistant, 600 florins ($243.60). Two hundred and eight laborers are daily engaged in sweeping streets where no machines are used; they use long reed brooms of material similar to that used in the United States. They are paid 1.30 florins (52.8 cents) for night work, from 11 P.M. to 5 A.M., and 1 florin (40.6 cents) for day work. On streets where the sweeping machine is used, fourteen men are employed to do the preparatory work. They are paid more than the common laborers, receiving 1.60 florins (65 cents) for night work, and 1.40 florins (56 cents) for day work. Ten overseers get 2 florins (81.2 cents) each per day. The head of the sweeping department can employ twenty-five additional men daily to assist in getting the streets cleaned. The wages paid to this extra force are charged to the fire department.

The dirt gathered daily from the streets was formerly dumped on large fields near Florisdorf, about 4 miles from this city, but recently the street department made arrangement with the various railway lines by which it is taken, in

the night, to the country, where farmers cart it from the station and are glad to be able to purchase such an excellent fertilizer.

Up to June, 1894, all the districts were swept and kept clean by contractors. Here, the contractors are not told how often to sweep the streets, but the different contractors, in bidding for their work, are asked to make a bid for keeping their respective districts clean, and the overseers in the employment of the city compel them to live up to their contracts. The judges as to whether the streets are clean or not are not the contractors, as the case too often is elsewhere, but the officials of the city.

In 1892 the cleaning of the first district, covering 407,613 square yards, cost $138,241, the contractors who did this work having in use ten small sweeping machines and twenty-one snow ploughs. In other districts the pay was arranged differently. Various smaller contractors were paid all the way from 25 to 50 cents per load of dirt or snow. The total sum expended for sweeping the streets of Vienna and for hauling the dirt away was $582,320 in 1892.

From this year on, the city will do its own street cleaning. It has purchased a number of sweeping machines, snow ploughs, etc., has engaged on an average 208 laborers daily, and expects to do the work better and more economically than under the old system.

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CLEVELAND'S WATER SUPPLY.—Colonel J. A. Smith, of the U. S. Engineer Corps, in discussing Cleveland's sanitary requirements, at a special meeting of the Cleveland Medical Society, called attention to the fact that the removal of 49,000,000 gallons of water daily from the lake by the water-works causes a perceptible flow of water toward the intake-crib and renders contamination easy. The natural flow of Lake Erie toward Niagara River amounts to 1100 feet a day, while the currents caused by changing winds are in every direction, and at times very powerful. The closeness of approach of the river current to the crib is now so complete that we would soon be drinking pretty pure sewage, and the biblical saying would be very apt: "Cast thy bread upon the waters, for it will return to you after many days."—*Western Reserve Medical Journal.*

# A PRACTICAL POINT IN THE USE OF DISINFECTANTS AND ANTISEPTICS.

By A. G. YOUNG, M.D., Augusta, Me., Secretary of the State Board of Health.

IN the large mass of literature which has appeared on the same subject since Koch's paper, "On Disinfection," it is rather surprising that the practical value of one of the suggestions in that paper was not more promptly apprehended and worked out. It was contained in this paragraph :

"Yet it is probable that many disinfecting agents which, under ordinary circumstances, are inefficient, may become sufficiently active when combined with moderately increased temperatures ; possibly also some such substances which have no disinfecting action at all at temperatures in the neighborhood of 20° C. (68° F.), as the example of carbon bisulphide teaches, may be used with excellent results at somewhat higher temperatures. In this direction, then, is a field open which will well reward experimental activity, and which all the more deserves attention because exact experiments are wanting with all but a very few of the greater number of disinfectants, and these have been shown to be practically useful only under certain conditions."*

In 1889 Professor Scalji,† of Rome, mentioned the following significant facts :

Normal urine, when maintained at a temperature of 45° C. (113° F.), undergoes fermentation as readily as when left at a temperature of from 15° to 25° (59° to 77° F.). If 5 centigrams of corrosive sublimate are added to one litre of urine, making a solution of 1:20,000, the urine putrefies at the end of several days if left at ordinary temperatures ; but it is preserved a month or more without a trace of fermentation if its temperature is maintained at 40° (104° F.). At this temperature of 40° the antiseptic action is assured with a dose of only 1:100,000 of the sublimate.

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* Mittheilungen aus dem Kais. Gesundheitsamte, I., 249, 1881.

† *Bulletin Medical-Revue D'Hygiene*, XII., 82, 1890.

Furthermore, Professor Scalji states, that when urine which contains 1:100,000 of sublimate is kept at the temperature of 40° several days, and then allowed to remain at ordinary temperatures (15° to 20° C.), no trace of fermentation appears.

Behring* refers to the fact, which has been confirmed by various observers, that a 5 per cent solution of carbolic acid at ordinary room temperature will not, even after many days, destroy anthrax spores with certainty, but he shows that, when the temperature of the solution is raised to 37.5° C. (99.5° F.), their destruction is complete in three hours.

Caustic solutions of the alkalies are more or less rapidly germicidal according to their strength, but Behring learned that the alkaline carbonates may become very energetic disinfectants when used at higher than ordinary temperatures. After working with strong solutions of carbonate of soda and of alkaline soaps, and finding that they, at degrees of temperature above 70° and 80° C. (158° and 176° F.), were rapidly effective, made a solution of washing soda about as it is used in laundries, and containing about 1.4 per cent of soda. This solution at 80° to 83° C. (176° to 181.4° F.) destroyed anthrax spores in ten minutes, and at 75° C. (167° F.), in twenty minutes.

He confesses that these results with warm and hot solutions of washing soda surprised him, particularly as he had, through special control experiments, assured himself of the high powers of resistance which his anthrax spores possessed.

But, so far as I know, Heider† has marked out more fully than any one else the influence which moderately increased temperature has upon the action of disinfecting solutions. Among the results of his investigations we may note the following, in which anthrax spores served as the test, and the number of minutes, hours, or days given, being the time required to sterilize them.

Carbolic acid, 5 per cent solution, at ordinary room temperature, not destroyed in from thirty to forty days; at 40° C. (104° F.), four hours; at 55° C. (131° F.), from three quarters to two hours; at 75° C. (167° F.), from three to fifteen minutes.

* *Zeitschrift für Hygiene*, IX., 395, 1890.

† *Archiv für Hygiene*, XV., 341, 1892.

Pure carbolic acid and sulphuric acid, equal parts of each by weight, 5 per cent solution, at 40°, in two hours; at 55°, in thirty minutes; at 75°, in one minute.

Pure cresol and sulphuric acid, equal parts of each, 5 per cent solution, at 40°, in one hour; at 55°, in five minutes.

Lysol, 5 per cent at 60° C. (140° F.), sterilization not effected in two hours; at 80° C. (176° F.), sterilization complete in five minutes.

Sulphuric acid, 1 per cent, at ordinary temperatures, sterilization not effected in seven hours; at 75° C., sterilization in seventy minutes.

Caustic potash, 5 per cent solution, at temperature of room, failed to sterilize in eight to ten hours; at 55°, spores destroyed in three fourths to two hours; at 75°, in two to ten minutes.

Hot water, at 70° C. (158° F.), in eight to nine hours; at 85° C. (185° F.), in forty to forty-five minutes; at 95° C. (203° F.), in fifteen minutes.

Sporeless bacteria, of course, succumb much more readily to the germicidal powers of disinfectants. With staphylococcus pyogenes aureus as a test, sterilization was complete at the temperature of 60° C. (140° F.), with carbolic acid, 1 per cent, in five minutes; with carbolic acid and sulphuric acid, 1 per cent, in one minute; with caustic potash, 1 per cent, three minutes; with lysol, ½ per cent, three minutes.

Several explanations of the reason why warm solutions of disinfectants show a more energetic germicidal action than cold solutions, suggest themselves. One is the well-known fact that the intensity of chemical action increases with increasing temperature; another is that moderately elevated temperatures favor the functional activity of bacterial life and therefore the rapidity with which poisons are absorbed. But when we have to do with sporeless bacteria, and that is the case in nearly all of the real work of disinfection, we have the direct co-operation of moist heat in destroying its vitality, even when the increase in temperature is hardly more than moderate.

Practical applications of the results of these investigations readily occur. In the first place, they suggest a grave doubt as to the efficacy of some processes of disinfection and anti-

sepsis as they may be carried out during the cold season. Next, they teach the great advantage of using antiseptic and disinfecting solutions warm or even hot.

In the disinfection of material containing the bacillus of tuberculosis, we have to do with an infection hard to destroy, but about whose powers of resistance, whether against chemical disinfectants or heat, investigators differ. Schill and Fischer* state that twenty-four hours are required for a 5 per cent solution of carbolic acid to disinfect tuberculous sputum. But the disinfection may be more rapidly and certainly accomplished if the carbolic solution for the disinfection of clothing be heated. or if the spittoon containing tuberculous sputum and disinfecting solution be first put in hot water and set aside to cool before it is emptied. Warm or hot solutions may therefore be used for the purpose of increasing the intensity of action of some of the disinfectants, thus extending the range of their applicability.

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When the articles to be disinfected can be subjected to the action of the solution for only a short time, as in washing floors or other woodwork, wiping down walls, or rubbing articles of leather or upholstered furniture which cannot be disinfected otherwise, rapidity and certainty of action should be increased by increasing the temperature of the disinfecting solution.

In clinical disinfection and antisepsis, it is an advantage to use the solutions as warm as practicable. It will sometimes enable us to diminish the strength of our solutions and thus minimize the danger of toxicity, without loss of disinfecting effect. In the dressing of wounds, and as intra-pleural and intra-uterine injections Professor Scalji says that he has used with excellent results very dilute but very warm bichloride solutions (40° to 45° C. equal 104° to 113° F.).

Another point of advantage in the use of warm disinfecting solutions is made by Nocht.† In the use of the so-called 100 per cent carbolic acid, its slight solubility in water is a hindrance. Mixed with water in the proportion of 5:100, a large portion of it remains undissolved. Clothing immersed in the

* Mittheilungen aus dem Kais. Gesundheitsamte II., 142, 1884.

† *Zeitschrift für Hygiene*, VII., 521, 1889.

mixture is permanently spotted and injured, for the reason that the fabric readily absorbs the insoluble part as well as the watery solution, and so is, in places, subjected to the action of the undiluted agent. If, however, to a hot solution of soap and water, the carbolic acid is added, and the mixture stirred, a clear solution is formed. Three per cent of soap in water at 60° C. (140° F.) will render 6 per cent of carbolic acid soluble. The appearance of fabrics soaked in this solution is much better than if subjected to the simple watery solution. The germicidal action of the solution is not increased by the presence of the soap, but heightened temperature makes it distinctly more effective. At 50° C. (122° F.) a 5 per cent solution with soap destroyed anthrax spores in six hours.—*Journal of Medicine and Science, September*, 1895.

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VIN MARIANI AND THE DISPENSARY LAW.—The Dispensary law in South Carolina has of late been so rigidly enforced that many druggists were afraid to sell even medicinal preparations containing wine as one of the constituent parts. This seriously interfered with the sales of the well-known tonic Vin Mariana throughout South Carolina, and the proprietors of that famous specialty made vigorous representations to the Governor on the subject. As a result of these representations, Vin Mariani has been specially exempted from the workings of the Dispensary law, as is shown by the following letter received by Messrs. Mariani & Co. from Governor Evans :

(Copy.)

State of South Carolina, Executive Department, Office of State Board of Control. Columbia, S. C., October 5th, 1895.

MARIANI & CO., 52 West Fifteenth Street, New York :

DEAR SIRS : In reply to your favor of the 30th ult., Governor Evans directs me to say that you have his permission to sell the Vin Mariani, and he will exempt it from seizure in the State when not sold as a beverage.

W. W. HARRIS, Clerk S. B. C.

## MEDICAL EXCERPT.

By T. P. CORBALLY, A.M., M.D.

PROTONUCLEIN is well deserving the attention of physicians in cases requiring a potent and acceptable stimulant to the assimilative powers of the digestive organs. During my present term of service as visiting physician to St. Peter's Hospital, Brooklyn, beginning November 1st, 1895, I have found occasion to use it in several cases.

In sub-acute and chronic cases of gastric and gastro-intestinal disease, its use has been eminently satisfactory. One case in particular, of gastric ulcer of long standing, subject to extreme nausea, vomiting, and hemorrhage, in which all the usual remedies in such cases were used without benefit, the patient's condition steadily growing worse, protonuclein was resorted to with such decided benefit that an hitherto apparently hopeless case was soon changed to a hopeful one. The protonuclein was given in five-grain doses, in powder form, every three hours, no other medicine, unless nutritive enemata may be so regarded—the only means of support used for several weeks previous to the administration of protonuclein. These are continued, but less frequently. Hemorrhage and vomiting have ceased, and the patient decidedly improving. In a severe case of chlorosis, with frequently recurring vomiting and constant eructations, protonuclein has been used with like benefit, the patient appears to be on the road to recovery. In a number of cases in private practice I have found its use alike beneficial.

THE TREATMENT OF PNEUMONIA WITH DIGITALIS.—Very recently M. Naegale-Sekerblom has published (*Centralblat für Klinische Medicin*) his observations on the treatment of pneumonia with digitalis. This treatment was first proposed by Dr. Petresco, of Bucharest, and subsequently followed by Lowenthal, Fike, Lépine, Messini, and others. The author prescribed, during the early stage of the disease, an infusion of 2 to 3 grams of the leaves of digitalis to 200 grams of water, to be taken in two days; instead of this infusion a correspond-

ing dose of the fluid extract may be given ; subsequently he gives, every hour, 4 to 5 drops of the following solution :

℞ Camphor..... 2 grams.
Liquor Ammoniacal anisi..... 8 grams.

If the pulse is over 100 in the minute, and if the temperature is above 39, the digitalis is renewed.

Lately much larger doses have been administered. In 61 cases thus treated there were 11 deaths, which gives a very large percentage. It is proper to remark, however, that the deaths occurred in old patients, 9 of whom were over 50 years of age, and in 2 whose ages exceeded 70 years. With the employment of 3 to 4 grams a day of the infusion, the crisis came on usually on the third or fourth day.

Digitalis relieves the congestion of the lungs and acts on the respiration by exciting the pneumo-gastric nerve, but it has no influence on the temperature.

If the leucocytosis is somewhat pronounced, it must be rendered more active by the use of pilocarpine, of antifebrine, or of antipyrine, for a weak leucocytosis is considered by the majority of authors as offering a very unfavorable prognosis. The same is true of cases in which there is an oscillation between hyper and hypo-leucocytosis, but a slow and regularly progressing hyper-leucocytosis warrants a favorable prognosis.

Experiments have proved that, in animals as in man, even when healthy, digitalis increases three or four times the number of leucocytes, and then also the results are favorable ; in order to render the effect more active the use of cold water will be necessary.

In conclusion, the author thinks that digitalis is one of the most active and useful agents that can be employed in pneumonia, for it undoubtedly lessens its duration, minimizes its severity, and is well borne by nearly all patients in doses of from 3 to 4 grams a day.

PNEUMONIA IN CHILDREN.—In the treatment of capillary bronchitis and catarrhal and lobar pneumonia in children, the necessity frequently arises for drugs which will control the fever, exert a sedative effect upon the circulation, and relieve the insomnia and restlessness. Of the antipyretics in common use, phenacetine has been shown by medical authorities

to be by far the safest and most reliable. Besides its property of reducing high temperatures it controls nervous irritability, alleviating the pain and cough and producing sleep. In the early stages of pneumonia in children Dr. C. G. Jennings (*Arch. of Pediatrics*) recommends the combined use of aconite and phenacetine at the height of the pyrexia. After the period of engorgement, however, aconite should be discontinued and antipyresis accomplished by the bath or phenacetine. In a discussion on croupous pneumonia in children before the Clinico-Pathological Society of Washington (*Maryland Medical Journal*), Dr. Deale expressed a preference for this remedy followed by quinine. A formula consisting of phenacetine and quinine sulphate, each one grain, and caffeine and benzoate of sodium, each one sixth grain to the dose, is highly recommended by Dr. D. C. Loewenthal (*Semaine Medicale*) and Dr. M. A. Cohn (*Medical Summary*). One powder is given every two to four hours to a child of sixteen months for the control of pyrexia. Dr. F. S. Parsons (*Medical Progress*) employs phenacetine for the nervous phenomena of pneumonia, giving from half to two grains to infants according to age. It would seem, therefore, that this remedy fulfils a number of important indications in the therapeutics of infantile pneumonia, and is equally useful for the control of high fever and the relief of the various nervous symptoms, pains, restlessness, and insomnia, with which the disease is so frequently attended in children.

THE TREATMENT OF DIPHTHERITIC ANGINA WITH TINCTURE OF MYRRH.—M. Miloslavsky (*Semaine Medicale*) recommends the application of a bandage renewed three or four times daily saturated with undiluted tincture of myrrh, and at the same time the administration internally of the following mixture :

| | | |
|---|---|---|
| ℞ | Tincture of myrrh..... | 4 grams. |
| | Glycerine pure..... | 8 " |
| | Water..... | 200 " |

A tablespoonful to be taken every two hours for adults ; for children, a teaspoonful if under two years, a dessertspoonful if between three and six years, every hour.

Besides this, in adults and in children who can gargle, M. Miloslavsky prescribes a gargle containing about 10 per cent of the tincture of myrrh.

HEADACHES OF EXTRA-CRANIAL ORIGIN.—In a paper on this subject, by Frank Woodbury, M.D., of Philadelphia, read before the Mississippi Valley Medical Association, at Hot Springs, Ark. (*Medical Record*), Professor Thomas Hunt Stucky, of Louisville, said : " When we take into consideration the many causes of headache, and look back upon the treatment for the past twenty years for the condition by opium or its alkaloids, chloral, the bromides, etc., and remember their tardiness of producing relief, the danger of having our patients become drug-habitues, 'tis, indeed, a fact that antikamnia has proven a Godsend to the people, as well as the profession. One fact is evident, and that is that antikamnia has almost entirely displaced opium, its compounds and derivatives. If it has done this and nothing more, its mission is a great one and its usefulness thoroughly established. ' It does not depress the heart's action ; it does relieve pain. An extended use from its first appearance on the market has served to increase my confidence in the great value of antikamnia.' "

TO CHECK SUBSTITUTION OF DRUGS, THE SANITARIAN unites with many other periodicals in the effort to expose and aid in the prosecution of offenders. To this end our readers are earnestly requested to report to us the name and address of any impostor they may encounter in this regard, with such particulars in substantiation of the offence as they may be able to obtain.

We will expose in our pages the names of fraudulent dealers on receipt of satisfactory evidence. All will admit that a physician who prescribes a certain remedy expects his prescription to be filled accordingly. A druggist has no right whatever to use his own judgment in the matter, otherwise he places the reputation of the physician as well as the life of his patient in jeopardy. Feeling that all doctors, honest druggists, and manufacturers of legitimate preparations will be benefited by our action in this matter, we solicit their assistance.

# EDITOR'S TABLE.

## SANITARIAN, JANUARY NUMBER, 1896.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

### HEALTH OF THE NAVY.

REPORT of Surgeon-General J. R. Tryon for the fiscal year ending June 30th, 1895, embracing a statement of the condition of the naval hospital fund, the naval medical establishment, and other matters of interest pertaining to the Bureau of Medicine and Surgery. There has been an excess of expenditure over the preceding year, in consequence of an increase in the number of men and of the number of ships going into commission, requiring an increased supply of surgical and medical outfits. The naval hospitals are for the most part in good condition, but several have required extensive repairs. The need of a proper building in which to treat infectious diseases, at the naval hospital at Portsmouth, N. H., as recommended in 1894, is again urged.

The sanitary condition of the navy yards and stations is, in general, good; but the surface drainage of several and the defective plumbing of the officers' quarters at the Boston yard are menacing to the health of the occupants.

The Naval Museum of Hygiene has been considerably improved during the year. "Rooms have been renovated and put in suitable condition to receive special exhibits. Exhibits are being classified, and water connections made in rooms set apart for display of house drainage, filters, and closets. . . .

"It is the intention of the Bureau to make the Naval Museum of Hygiene as complete in every arrangement and detail as establishments of like character abroad, and it is expected by another year to have the present instructive exhibit properly classified, so as to show the advances that have been made to date in sanitary science, and opportunity given for the practical study of hygiene, so essential to the welfare of the Navy and the public at large."

*The Naval Laboratory and Department of Instruction* is in operation. Three assistant surgeons have received the prescribed course of instruction during the past year, and one medical officer who has just passed a successful examination for admission to the corps is at present undergoing instruction.

All examination papers received since last report have been carefully inspected, and continue to give evidence of satisfactory work on the special branches taught.

Sick Quarters on United States Naval Vessels was a special subject of animadversion in the preceding annual report, with special reference to the deficiencies in some of the new ships. The subject is thoroughly treated by the Surgeon-General in the report before us, under the title of *The Relation of Naval Architecture to Proper Sanitation*, which we purpose to make room for entire in our next number. "*Handling Sick and Wounded; Ambulance Ship*" is a germane subject. "It is stated 'that a battleship, with a complement of 500 men, in action, if not sunk, will have within a few minutes 30 killed and 120 wounded.'

"In the battle between the Chinese and Japanese fleets, off the Yalu River, September 17th, 1894, the fragments of one shell fired at long range at the *Tsi Yuen*, killed 7 men and wounded 14. Commander McGiffen states in his account of the battle that one steel shell, having a bursting charge of 90 pounds of powder, struck the Japanese flagship and killed instantly 49 officers and men and wounded over 50.

"The figures given, however, must impress every one with the gravity of the entire question, and the necessity of making a commencement of better methods in the service. With this end in view, a great deal of attention has been paid to the subject during the past year, and medical officers of the Navy have been requested to present to the Bureau their views regarding the subject. Valuable and instructive papers have been prepared on this question by P. A. Surgeons A. C. H. Russell and E. R. Stitt, and are embraced in the list of special reports."

*Vacancies in the Medical Corps* still exist, and without increased inducements are likely to continue.

During the last fiscal year there were 269 applications made to the Department for information concerning the appoint-

ment of assistant surgeons in the Navy. Replies containing instructions were promptly forwarded in every instance. Out of this number only 33 applied for permission to appear before the naval medical examining board; and of these 19 presented themselves. Three were rejected physically, and 12 professionally, leaving only 4 out of the 269 original applicants, representing every section of the country, who were found qualified for appointment as assistant surgeon.

"It may be well to mention, for comparison, that there is no difficulty in filling vacancies in the Medical Corps of the Army and Marine Hospital Service, both corps having at present the full quota of assistant surgeons allowed by law, while at this date there are 14 vacancies in that grade in the Medical Corps of the Navy, and the services of that number of assistant surgeons are needed at once for hospitals, ships, and other stations. The law does not provide for the temporary appointment of acting assistant surgeons to meet the emergency that has arisen."

*Antitoxin* is very fully reported upon by P. S. Surgeon Cordeiro, who by the direction of the Bureau made a thorough investigation of the subject at Berlin.—An abstract of Dr. Cordeiro's report is given on other pages.

*Strychnia* has been further used in the treatment of pneumonia, with the effect of strengthening the favorable opinion of it before expressed, 45 cases of acute lobar pneumonia having been treated with it in the naval hospital at Brooklyn in the last two years with but 3 deaths, a mortality of 6.06 per cent.

*Medical Aspect of the Construction of the Nicaragua Canal* is the subject of a special report by P. A. Surgeon Stitt, comprehending observations on the climate and morbific conditions. It will appear in full in a subsequent number. *A Hospital Corps* is recommended, to consist of men enlisted for that special duty, instructed, drilled, and equipped for all duties pertaining to such service. "A bill with this object in view, combining every feature required to meet the immediate wants of the service, has been carefully prepared, and will be submitted at an early date with sufficient arguments in favor of the measure to secure approval."

*Mean strength of the Navy and Marine Corps*, including officers and men, for the year 1894:

Officers of the Navy and Marine Corps on the active list, 1555 ; enlisted men of the Navy, including apprentices, 8804 ; enlisted men of the Marine Corps, 2161 : 12,520.

*Mean strength of the force afloat*, 10,482.

Total number of patients under treatment during the year 1894 :

Naval hospitals, 1767 ; navy yards and shore stations, 1912 ; vessels afloat and receiving ships, 8609 : 12,288.

Total number of days the sick were under treatment during the year 1894 :

Naval hospitals, 82,502 ; navy yards and shore stations, 11,343 ; vessels afloat and receiving ships, 62,966 : 156,811.

Total number of deaths from all causes during the year 1894 :

Naval hospitals, 63 ; navy yards and shore stations, 11 ; vessels afloat and receiving ships, 48 : 122.

Ratio per 1000 of deaths in the Navy and Marine Corps for the year 1894, 9.74.

*Summary—Force Afloat.*

| | |
|---|---|
| Daily average number of sick | 172.50 |
| Average number of days each case was under treatment | 7.31 |
| Admissions per 1000 of mean strength | 821.31 |
| Invaliding per 1000 of mean strength | 97.50 |
| Deaths per 1000 of mean strength | 4.57 |

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA.—Jerome Cochrane, M.D., State Health Officer, Montgomery.

*Mobile*, 31,076 : I. A. Abrahams, M.D., Health Officer, reports for October total number of deaths 94—21 under five years of age. From zymotic diseases, 25—21 from fevers. Annual death-rate, 32.6.

A movement is finally on foot for sewering the city.

CALIFORNIA.—C. W. Nutting, M.D., President, Etna Mills ; J. R. Laine, M.D., Secretary, Sacramento.

October : Population, 746,220. Total mortality, 899. An-

nual death-rate per 1000, 14.40. From zymotic diseases, 110 deaths; from consumption, 126.

*San Francisco*, 330,000: Deaths, 480; from consumption, 73; zymotic diseases, 21. Death-rate, 17.4.

*Los Angeles*, 80,000: Deaths, 84; from consumption, 14; zymotic diseases, 7. Death-rate, 13.9.

*Oakland*, 60,000: Deaths, 64; from consumption, 6; zymotic diseases, 4. Death-rate, 12.3.

*Sacramento*, 30,000: Deaths, 30; from consumption, 3; zymotic diseases, 4. Death-rate, 12.0.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. A. Lindsley, M.D., Secretary, New Haven.

*Monthly Bulletin* reports the mortality for November from 166 towns in the State, 1041; 109 less than in October, and 35 more than the average number of deaths in November for the five years preceding the present. Death-rate, 15.8 for the large towns; for the small towns 13.9, and 15.4 for the whole State. Deaths from zymotic diseases, 162—15.5 per cent of the total mortality. From *diphtheria* (and croup), 56; *typhoid-fever*, 30. Diphtheria was chiefly prevalent in New Britain, where the number of deaths from it was 13; New Haven, 7; Waterbury, 6. Of the 30 deaths from typhoid-fever, 7 were in Hartford, and in New Haven and Waterbury 5 each. From *consumption* the total number of deaths reported was 112.

COLORADO.—*Julesburg*, November 9th: *Diphtheria* is reported prevalent along the north line leading into Colorado from Nebraska. The country schools have nearly all been closed, and from present appearances the public school will be closed on Monday.

DELAWARE.—E. W. Cooper, M.D., President, Camden; E. B. Frazer, Secretary, Wilmington.

*Wilmington*, December 15th: A report from Sussex County says that *diphtheria* is raging in *Nanticoke* hundred, and that within the past two weeks more than a dozen families have been attacked by the disease.

DISTRICT OF COLUMBIA, 270,514 : W. C. Woodward, M.D., Health Officer.

Mortality for the four weeks ending November 30th, 420, of which number 195 were of colored people. The annual death-rate was 19.80 per 1000. There were 75 deaths from zymotic diseases, and 56 from consumption.

*Typhoid-fever* continues prevalent, but most in the suburbs. The construction of filter-beds is urged by the Health Officer to remove impurities which cannot be prevented from entering the river water supply.

FLORIDA.—Hon. W. B. Henderson, President, Tampa ; Joseph Y. Porter, M.D., State Health Officer, Jacksonville.

*Florida Health Notes* report that during the month of August there were 341 deaths in a population of 391,422. There were 104 under five years of age, and 141 were of colored people. The annual death-rate per 1000 was 10.41.

ILLINOIS.—William E. Quine, M.D., President, Chicago ; J. W. Scott, Secretary, Springfield.

*Chicago*, 1,600,000 : William R. Kerr, Commissioner. October : There were 2020 deaths, of which 820 were under five years of age. Annual death-rate per 1000, 15.07. Zymotic diseases, 449 ; tubercular diseases, 204.

*Diphtheria* and *typhoid-fever* continue prevalent. The progress of the Health Department in supplying antitoxin for the treatment of diphtheria appears to be quite taken aback by the recent attitude of Dr. John B. Hamilton, Consulting Hygienist of the Department, who in the leading editorial of the *Journal of the American Medical Association* of December 14th, accepts the results of Mr. Lennox Browne's investigations, showing what sanitarians have all along emphasized, that the immunizing effects of antitoxin are but temporary and not to be relied upon as a preventive measure. Mr. Browne's statements with regard to the dangers of the antitoxin treatment are decidedly at variance with the consensus of a multitude of observers of at least as high standing as he, and with more than equal opportunities for accurate observation. Dr. Hamilton states that his purpose is " to emphasize the necessity of making haste slowly in accepting every con-

tinental fad that is forced upon us." A well-merited caution, surely, in its general aspect, but in this particular, like Mr. Browne's published results, devoid of freshness; they emphasize Dr. Cordeiro's report on "Behring's Diphtheria Serum," on other pages of this number, made nearly a year ago. But its curative effects are beyond question.

*Decatur*, December 12th: *Diphtheria* has become in a measure epidemic in Decatur and vicinity. In the country east of the city a school has been closed.

*Shelbeyville*, December 7th: *Typhoid-fever* is now epidemic in this section, and whole families are prostrated with it.

INDIANA.—Douglas C. Ramsey, M.D., President, Mount Vernon; C. N. Metcalf, M.D., Secretary, Indianapolis.

*Indianapolis.*—Total number of deaths reported for October, 1895, 211. Deaths from *diphtheria*, 25; *typhoid*, 26; tuberculosis, 18. Contagious diseases reported: Diphtheria, 122; scarlatina, 7; measles, 15.

IOWA.—Frederick Becker, M.D., President, Claremont; J. F. Kennedy, M.D., Secretary, Des Moines.

Since Health *Bulletin* for August:

*Diphtheria:* Council Bluffs (epidemic), Nora Springs, Pleasantville, Essex, Van Buren Township, Lynnville, Shenandoah, Charleston Township, Correctionville, Clarion, What Cheer, Onawa, Castana (epidemic), Franklin Township, Liberty Township, Sheldon (epidemic), Clinton Township, Garfield Township, Lincoln Township, West Union, Eagle Grove, Boone (epidemic), Rhodes.

*Scarlet-fever:* Liberty Township, Village Township, Hull, Chequest Township, West Union, Peterson, West Chester, Marietta Township (epidemic), Exira, Lake City, Garnavillo, Belmond Township.

*Typhoid-fever:* Dysart, Toledo (epidemic), Jolley, Colesbury, Hampton, Spencer, Homestead, Osceola County (epidemic), Strawberry Point, Lansing.

KANSAS.—T. E. Raines, M.D., President, Concordia; T. Kirkpatrick, M.D., Secretary, Westphalia.

KENTUCKY.—Joseph M. Matthews, M.D., President, Louisville; J. N. McCormack, M.D., Secretary, Bowling Green.

*Ashland*, November 13th: Scarlet-fever is making ravages in the city, and to date 13 deaths have resulted this month.

LOUISIANA.—S. R. Oliphant, President, New Orleans; W. R. Harnan, M.D., Secretary, New Orleans.

*New Orleans*, 275,000 (80,000 colored): S. R. Oliphant, M.D., President.

The mortality for four weeks ending November 30th was 569—206 colored. Under five years of age, 165. The annual death-rates per 1000 were: whites, 24.28; colored, 33.59; total, 26.99. Zymotic diseases caused 81 deaths; tubercular diseases, 52.

During the month of October there were 37 cases of *diphtheria* and 2 deaths, 7 cases of *scarlatina*, 33 cases of *small-pox*, and 7 deaths. Total number of vaccinations for October, 19,396. Up to date, during the year, there had been 206 cases and 41 deaths from small-pox. Since November 1st there had been 34 cases and 6 deaths. There are 30 cases on hand. Up to date there have been 32,714 vaccinations by the regular physicians.

MAINE.—C. D. Smith, M.D., President, Portland; A. G. Young, M.D., Secretary, Augusta.

*Bar Harbor*, December 12th: The Board of Health has had a house on the fashionable ocean drive burned, together with its contents, in order to stamp out, if possible, the germs of *typhoid-fever* which were found there.

*Saco*, November 11th: This morning all of the East End schools were closed and placarded on account of scarlet-fever. Between 40 and 50 pupils are down with it.

MARYLAND.—John Morris, M.D., President, Baltimore; James A Steuart, M.D., Secretary, Baltimore.

*Baltimore*, 496,315: James F. McShane, M.D., Health Commissioner.

October: Total mortality, 790—298 under five years of age. Annual death-rate, 19.11 per 1000.

From zymotic diseases there were 107 deaths; from con-

sumption, 84. Of infectious diseases reported there were typhoid-fever, 75 cases; diphtheria and croup, 62; scarlatina, 58; measles, 99.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M.D., Secretary, Boston.

*Boston*, 494,205: S. H. Durgin, M.D., Chairman. October: 946 deaths, of which 355 were under five years of age. The annual death-rate was 22.97 per 1000. From zymotic diseases, 159; tubercular diseases, 165. Of zymotic diseases the number of cases reported during the month were: Diphtheria, 412; measles, 18; scarlatina, 127; typhoid-fever, 187.

*Whitinsville*, December 10th: This town is at present suffering from one of the worst *scarlet-fever* epidemics it has ever known.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M.D., Secretary, Lansing.

For the month of November, 1895, compared with the preceding month, pleuritis, pneumonia, influenza, scarlet-fever, bronchitis, and tonsilitis increased, and cholera infantum, dysentery, cholera morbus, diarrhœa, typhoid-fever, and remittent-fever decreased in area of prevalence.

Consumption was reported at 188 places; typhoid-fever at 142 places; diphtheria at 71 places; scarlet-fever at 64 places; whooping-cough at 16 places; measles at 10 places, and smallpox at 3 places.

*Detroit*, 250,000: S. P. Duffield, M.D., Health Officer. The mortality for October amounted to 337, of which 128 were under five years of age. Annual death-rate per 1000, 13.48.

Zymotic diseases, 72; tubercular diseases, 23.

MINNESOTA.—Franklin Staples, M.D., President, Winona; C. N. Hewitt, M.D., Secretary, Red Wing.

*St. Paul*, 140,292: Alexander J. Stone, M.D., Commissioner. October: 152 deaths—62 under five years of age. Annual death-rate per 1000 was 13.00. Deaths from zymotic diseases, 33, and from tubercular diseases, 16.

*Minneapolis*, 225,602: H. N. Avery, M.D., Health Commissioner. October: 194 deaths—72 under five years of age.

The annual death-rate per 1000 was 9.27. Zymotic diseases caused 65 deaths, and tubercular diseases, 25.

*Duluth*, December 15th: *Typhoid-fever* is epidemic. It began about three weeks ago, and to-day there are between 700 and 800 cases in Duluth alone. Until the present time an effort has been made to suppress the facts, but now the Health Department has issued a warning calling upon the people to exercise the utmost caution. Responsibility is laid at the door of the Water Company. Milkmen are also under suspicion. A commission has been appointed to investigate the subject.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Willis P. King, M.D., Secretary, St. Louis.

*St. Louis*, 560,000: M. C. Starkloff, M.D., Commissioner of Health.

October: Deaths, 871; under five years of age, 283; from zymotic diseases, 200; from phthisis and tuberculosis, 77. Annual death-rate per 1000, 17.77.

*Kansas City*, 150,000: R. P. Waring, M.D., Health Officer. October: Deaths, 171; under five years of age, 46. Annual death-rate per 1000 was 13.68.

NEBRASKA.—J. V. Beghtol, M.D., President, Friend; F. D. Haldeman, M.D., Secretary, Ord.

NEW HAMPSHIRE.—G. P. Conn, M.D., President, Concord; Irving A. Watson, M.D., Secretary, Concord.

*Manchester.*—Deaths during the month of October, 92, of which 5 were from *typhoid-fever*. Twenty-six cases of contagious diseases were reported to the board, of which 12 were typhoid-fever, 8 scarlet-fever, 3 measles, 3 diphtheria. Death-rate, 18.78.

*Portsmouth*, December 12th: Gravelly Ridge has an epidemic of *diphtheria*.

NEW JERSEY.—C. F. Brackett, M.D., President, Princeton; Henry Mitchell, M.D., Secretary, Asbury Park.

*Hudson County—Jersey City* and vicinity—318,746: October: Deaths, 492; under five years of age, 197; from zymotic

diseases, 80; from consumption, 61. Annual death-rate per 1000, 22.00.

*Newark*, 200,000: Health Officer Lehlbach reports for November: Diphtheria cases, 226, an increase over October of 42; scarlet-fever, 82, an increase of 35; total number of cases of contagious and infectious diseases, 333, increase of 71. Deaths from all causes, 308.

*Diphtheria* is reported prevalent in Hoboken, Long Branch, Rahway, Flemington, and Hackettstown.

*Typhoid-fever* is reported prevalent in Camden, Raritan, and Somerville.

NEW YORK.—Daniel Lewis, M.D., President, Syracuse; B. T. Smelzer, M.D., Secretary, Albany.

For September the State Board *Bulletin* reports that there have been reported 9320 deaths during the month, or a daily average of about 300, against one of 337 in the preceding month. Compared with the corresponding period of last year, which was one of unusual salubrity, the total mortality is greater by 300. The infant mortality is unusually low, 31.5 per cent of the total, that of the last ten years, in October, being 32.5 per cent; in September the relative proportion was 41.5 per cent. The zymotic mortality, which caused 25 per cent of the deaths in September, is reduced to 16.7 per cent, on account of a large decrease from an excessive diarrhœal mortality, which is less by 1100 deaths, and which is reported as having caused but 550 deaths, or 6.0 per cent of the mortality for the month, which is about the normal average; the decrease is uniform throughout the State. Typhoid-fever caused nearly 3.0 per cent of all deaths, which is the average for October; its relative prevalence is greatest in the more sparsely settled sanitary districts, but 1.5 per cent of the deaths being from this cause in the maritime district against nearly 5.0 per cent in the rest of the State; its largest prevalence is reported from Watertown, Niagara Falls, Binghamton, Oneonta, Churchville, and Erwin. Diphtheria caused 458 deaths, 135 more than in September, but 100 less than in October, 1894; 5.0 per cent of the deaths were from this cause, the maritime and Hudson Valley districts reporting in somewhat larger rate than this, the Lake Ontario and West-

ern district having had 8.0 per cent, while in the rest of the State there were only 2.0 per cent of deaths from this cause. Scarlet-fever caused but 36 deaths, of which 20 occurred in the maritime district. Measles caused 46 deaths, all in the maritime and Hudson Valley districts; its greater prevalence will be noted in October. Consumption caused 12.0 per cent of the deaths, the largest since May. Acute respiratory diseases caused an unusually small mortality for the season, being but little greater than in September. The average temperature, over the State, was 45°, which is much below the normal, with high barometer and deficiency in rainfall, and northerly and westerly winds of unusual velocity.

*The Milk Supply of Cities.*—At a meeting of the State Board of Health of New York on November 29th, it was decided to adopt vigorous measures to insure the purity of the milk supply of the larger cities. An effort will be made to secure a larger appropriation from the Legislature at its approaching session, and a committee consisting of Health Officer Doty and Drs. Cassidy and Lewis was appointed to attend to the matter.

*The New York City Board of Health*, December 3d, appointed President Charles G. Wilson, Sanitary Commissioner G. B. Fowler, M.D., and Drs. Herman M. Biggs and E. J. Lederle a committee to confer with a committee of the State Board of Health on measures to prevent an impure milk supply.

The Board amended Section 186 of the Sanitary Code to read: "No milk which has been watered, adulterated, reduced, or changed in any respect by the addition of water or other substance, or by the removal of cream shall be brought into, held, kept, or offered for sale at any place in the city of New York."

*New York*, 1,995,000: Total deaths, 3175—1118 under five years. Death-rate, 18.75. Zymotic diseases, 414 deaths; 112 from (*croup and*) *diphtheria; typhoid-fever*, 48. Deaths from consumption, 450.

The Board has resolved that no meat or poultry shall be hung outside of the shops to collect the dried filth of the streets. But fruit and vegetables are equally liable, and should be included in the prohibition; and should Brooklyn follow the example, inclusive of the suggested addition, there

would be some hope of checking the progress of diphtheria.

*Brooklyn*, 1,100,000: Total deaths, 1710—705 under five years. Death-rate, 17.44. Zymotic diseases, 330 deaths; from (*croup and*) *diphtheria*, 130, an increase of 35 over the previous month; from typhoid-fever, 20; from consumption, 201.

The number of deaths from (croup and) *diphtheria* during the four weeks ending December 21st was 181, which represents about 1000 cases, but still no epidemic! the Health Department protests. "Recognizing," however, "at the present time (December 15th) an unusual prevalence of diphtheria in this city, and realizing that measures instituted to limit its spread must receive the hearty co-operation of the medical profession in order to be effective, the Department of Health desires to call your attention to" certain recommendations that follow, in a circular addressed to the physicians of the city, by the Health Commissioner, enjoining special care with regard to the diagnosis, care, and *treatment* of the disease; but excepting isolation of the sick, no effort is apparent against the conditions broadcast promotive of the continued prevalence of the disease, such as were in part described in our previous number, and the storage and consequent putrefaction of animal excrement in hundreds of underground stables and thousands of putrefactive vaults scattered throughout the city, *authorized* by the "health" ordinances!

*Diphtheria* has also prevailed extensively in several of the *Long Island villages*, in constant communication with Brooklyn, in which the Brooklyn newspapers appear to have taken more interest than of the disease in their midst.

*Syracuse*, 95,000: Total deaths, 126—38 under five years of age. Death-rate, 16.0. Zymotic diseases, 23 deaths; from consumption, 12.

*Albany*, 100,000: Total deaths, 164—53 under five years. Death-rate, 19.68. Zymotic diseases, 31 deaths; from *diphtheria* and *typhoid-fever*, each 6; from consumption, 24.

*Buffalo*, 335,709: Total deaths, 394—151 under five years. Death-rate, 14 10. Zymotic diseases, 109 deaths; from consumption, 34.

*Rochester*, 150,000: Total deaths, 175—53 under five years.

Death-rate, 13.13. Zymotic diseases, 30 deaths; from consumption, 20.

*Elmira*, 30,000: November 26th: William C. Wey, M.D., Health Officer, reported that of a total of 100 cases of *typhoid-fever* reported in that city since January 5th, 1895, 11 were fatal, or about 9 per cent, giving an average of 10 cases a month for the past ten months, with a mortality of about 10 per cent.

He said that "while the specific cause of the disease cannot be made out in this community, among people who use city water, water from driven and curbed wells, and filtered water, it is to be inferred, especially in households in which more than one case is produced, that local influences are at the bottom of its development in many cases."

NORTH CAROLINA.—H. T. Bahnson, M.D., President, Salem; Richard H. Lewis, M.D., Secretary, Raleigh.

The *Bulletin* of the State Board of Health records for October 139,485 population—58,963 colored. Total mortality, 222—132 colored. Mortality under five years of age, 71—41 colored. Annual death-rates per 1000: white, 13.4; colored, 26.8; total, 191. Zymotic diseases, 73; consumption, 32.

OHIO.—Byron Stanton, M.D., President, Cincinnati; C. O. Probst, M.D., Secretary, Columbus.

*Cincinnati*, 336,000: J. W. Prendergast, M.D., Health Officer. October: 441 deaths, representing an annual rate of 15.45 per 1000. There were 123 deaths under five years of age. From zymotic diseases there were 64 deaths, and from consumption, 56.

*Cleveland*, 262,000: J. L. Hess, M.D., Health Officer. Deaths from *diphtheria* (and croup) in October, 56; *typhoid-fever*, 17; consumption, 46. Total from all causes, 451. Death-rate, 16.34.

*Toledo*, 120,000: J. T. Woods, M.D., Health Officer. There were 117 deaths in October; 39 were under five years of age. Annual death-rate per 1000, 11.9. Zymotic diseases caused 16 deaths, consumption caused 11 deaths.

*Small pox* is giving the State Board a good deal of trouble by its continued cropping out at several places along the Ohio,

at Martin's Ferry, Bellaire, West Wheeling, Bridgeport, and Ætnaville. December 10th: "There are now 14 cases at Bridgeport and 4 at Martin's Ferry. The epidemic was caused by the public funeral of a man who died from the disease." But such energetic measures are in process that it is not likely to spread.

PENNSYLVANIA.—S. T. Davis, M.D., President, Lancaster; Benjamin Lee, M.D., Secretary, Philadelphia.

*Philadelphia*, 1,163,864: Theodore B. Stubb, Health Officer, reports: In the four weeks ending November 30th, deaths, 1616—492 under five years of age. Annual death-rate, 18.09 per 1000. Deaths from zymotic diseases, 229; from consumption, 119.

*Diphtheria* is increasingly prevalent. For the week ending December 7th there were 102 cases with 29 deaths; *typhoid fever*, 43 cases with 8 deaths.

*Pittsburgh*, 275,000: J. Guy McCandless, M.D., Registrar reports for four weeks ending November 30th: Deaths, 425—148 under five years of age. Deaths from zymotic diseases, 83; from consumption, 38. Annual death-rate, 16.35.

*Typhoid-fever* continues at latest dates in both *Pittsburgh* and *Allegheny*, but with lessening prevalence. Pittsburgh now appears to be more concerned with *diphtheria* than typhoid-fever. November 25th: Ten new cases were reported, and but 2 of typhoid-fever. In Allegheny the deaths reported to have occurred this calendar year from typhoid-fever, by months, were as follows: January, 11; February, 8; March, 5; April, 8; May, 6; June, 3; July, 12; August, 14; September, 18; October, 29; to November 12th, 23.

December 8th: *Diphtheria* is epidemic in Allentown, Millvillage, Ardmore, and Bryn Mawr.

RHODE ISLAND.—A. G. Sprague, M.D., President, River Point; Gardner T. Swarts, M.D., Secretary, Providence.

*Providence*, December 17th: The number of *typhoid-fever* cases in the city continues to increase daily, and in a majority of cases reported the families in which they occur have used the milk supplied by milkman Arnold. The record of 20 cases last week, with 13 for the preceding week, will probably

exceed that of any two weeks for many years. So far during the present month 35 cases have been reported, leaving only 15 more for the next two weeks to equal the record of January of last year—50 cases.

*Diphtheria* is also prevalent and increasing, and in *Johnston* it is epidemic.

*Scarlet-fever* is epidemic in *Whithinsville.*

SOUTH CAROLINA.—J. R. Bratton, M.D., Chairman, Yorkville; H. D. Fraser, M.D., Secretary, Charleston.

*Charleston*, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M.D., Health Officer, reports for four weeks ending November 30th: Deaths, 121—77 colored. Under five years, 31; deaths from zymotic diseases, 21; consumption, 24. Annual death-rates, white, 19.55; colored, 27.57: 24.03 per 1000.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville; J. Berrien Lindsley, M.D., Secretary, Nashville.

*Bulletin* report of the principal diseases, named in the order of their greater prevalence, in the State for the month of November were lung diseases acute, typhoid-fever, malarial-fever, consumption, diphtheria, scarlet-fever, whooping-cough, la grippe, typho-malarial-fever, measles, croup, rheumatism, mumps, chicken-pox, small-pox, cerebro-spinal meningitis and erysipelas. Typhoid-fever was reported in the counties of Carroll, Crockett, Davidson, Dickson, Gibson, Hardeman, Humphreys, Perry, Roane, Robertson, Rutherford, Shelby, Setwart, Van Buren, Wayne and Weakley; diphtheria in Anderson, Carroll, Davidson, Gibson, Hamilton, Robertson, Shelby and Weakley.

UTAH.—*Salt Lake City*, 48,076: William T. Dalby, M.D., Commissioner. October: Total deaths, 58—18 under five years of age. There were 20 cases of *scarlet-fever*, and 10 of *typhoid-fever*. Annual death-rate, 14.4 per 1000.

VIRGINIA.—R. W. Martin, M.D., President, Chatham; A. Irving, M.D., Secretary, Richmond.

*Norfolk*, December 5th: The State Board of Health is vigorously urging members of the Legislature to needful action for its support. The appropriations of other States for the

maintenance of the public health are cited as examples. Massachusetts heads the list with $111,000, and Texas comes next with $61,000; Illinois, about $50,000; Alabama, $13,000; Maryland, $13,000; North Carolina, $5500; South Carolina, $3000; Tennessee, $3000; but the Virginia statute provides expressly that our board "shall not in any way be a charge upon the State"—in short, expects the Board to render its services gratuitously!

WISCONSIN.—Solon Marks, M.D., President, Milwaukee; U. O. B. Wingate, M.D., Secretary, Milwaukee.

*Milwaukee*, December 9th: "I notice an error in the last number of THE SANITARIAN, on page 523, in the abstract of a paper on 'Small-pox in Wisconsin,' presented by myself at the meeting of the American Public Health Association in Denver. The same error occurred in the report given in the *Journal of the American Medical Association*. It states:

"'There are, however, about 475 legally organized local boards of health in the State.'

"This should read 1175 legally organized local boards of health.

"U. O. B. WINGATE, *Secretary*."

*Milwaukee*, 275,000: H. E. Bradley, M.D., Commissioner. October: Total mortality, 308—147 under five years of age. Annual death-rate, 14.78 per 1000. Zymotic diseases caused 75 deaths, and tubercular diseases, 32. December 6th: There are now 13 cases of *diphtheria* in the city.

CANADA.—*Toronto*, December 5th: *Diphtheria* is at present raging in the heart of St. John's Ward. Cases are reported on Chestnut, Centre, and Elm streets, and also on Gerard Street West. Several children from Elizabeth Street School have developed the disease.

*Ottawa*, December 4th: Fifty-four patients are being cared for in the Protestant Hospital, 19 of whom are in the contagious diseases department. Of these last mentioned nearly all are afflicted with *diphtheria*.

*Montreal*, December 4th: The *typhoid-fever* epidemic at the penitentiary of St. Vincent de Paul is still prevailing.

BUENOS AYRES, 616,764: September: Total mortality,

1289—700 under five years of age. Annual death-rate, 25.2 per 1000.

Infectious diseases caused 148 deaths, tubercular diseases, 108.

HAVANA.—A dispatch to the *Herald*, December 17th, says: "Although the epidemic of yellow-fever, which has been fatal to so many in the Spanish army during the last six months, is subsiding, a new and even more terrible scourge has appeared in the form of variola nigra, black small-pox, imported from Africa on the government troop ships lately arriving with reinforcements. About 90 per cent of the cases so far reported have proved fatal.

"The insurgents of the province of Santa Clara are establishing in the Maestra Mountains important agricultural zones, where prisoners are employed in planting yams, potatoes, and beans to supply the rebel army."

MORTALITY STATISTICS ABROAD FOR THREE MONTHS ENDING SEPTEMBER 30TH, 1895.

Population, total mortality, annual death-rate per 1000, and deaths from small-pox:

London, 4,392,346; 20,389; 18.6; 31. Glasgow, 695,876; 3168; 18.2; 1. Manchester, 524,865; 3350; 25.5; 2. Liverpool, 503,967; 3549; 28.2; 2. Birmingham, 496,751; 2315; 18.6. Leeds, 395,546; 2063; 20.9. Dublin, 349,594; 2119; 24.2; 12. Sheffield, 342,768; 1928; 22.5. Edinburgh, 273,535; 1124; 16.4; 1. Belfast, 273,277; 1521; 22.3. Bristol, 228,139; 818; 14.3. Nottingham, 226,658; 1042; 18.4. Bradford, 226,384; 1177; 20.8. Hull, 216,722; 1367; 25.2. Salford, 208,253; 1414; 27.2. Newcastle, 207,021; 1018; 19.7. Portsmouth, 174,751; 762; 17.4. Norwich, 107,127; 561; 20.9. Amsterdam, 451,493; 1658; 14.7. Rotterdam, 272,042; 1154; 17.0; 1. The Hague, 180,455; 856; 19.0. Luxembourg, 19,945; 75; 15.0. Paris, 2,424,705; 11,718; 19.3; 5. Lyons, 438,077; 1979; 18.1. Lille, 200,325; 1317; 26.3. St. Étienne, 133,443; 655; 19.6. Nantes, 125,029; 633; 20.3. Havre, 116,369; 869; 29.9; 2. Rouen, 111,847; 944; 33.8; 13. Rheims, 105,408; 672; 25.5. Nice, 97,720; 361; 14.8; 1. Nancy, 90,748; 510;

22.5. Limoges, 72,697; 400; 22.0. Besançon, 54,636; 250; 18.3. Berlin, 1,820,340; 10,104; 22.2. Hamburg, 608,710; 2980; 19.6. Leipzig, 414,023; 3034; 29.3. Munich, 396,000; 2881; 29.1. Breslau, 367,769; 2844; 30.9. Dresden, 320,600; 1875; 23.4. Cologne, 314,000; 2133; 27.2. Magdeburg, 241,389; 1517; 25.1. Frankfort, 203,332; 956; 18.9. Düsseldorf, 171,638; 1272; 29.6. Königsberg, 171,305; 1340; 31.3. Nuremberg, 167,982; 977; 23.3. Chemnitz, 164,744; 1480; 35.9. Altona, 158,782; 763; 19.2. Bremen, 137,616; 588; 17.1. Elberfeld, 141,189; 641; 18.2. Stuttgart, 135,594; 652; 19.2. Stettin, 131,523; 1220; 37.1. Barmen, 128,129; 454; 14.2. Dantzig, 125,412; 877; 28.0. Crefeld, 119,251; 523; 17.5. Halle, 119,203; 820; 27.5. Aix-la-Chapelle, 110,570; 858; 31.0. Essen, 91,209; 516; 22.6. Metz, 65,791; 272; 16.5. Berne, 48,328; 228; 18.9. Basle, 78,860; 337; 17.1. Geneva, 80,111; 378; 18.9. Lausanne, 36,619; 154; 16.8. Zurich, 126,497; 434; 13.7. Chaux-de-Fonds, 31,173; 145; 18.6. Brussels, 187,924; 791; 16.8. Vienna, 1,495,764; 8007; 21.4. Buda-Pesth, 566,022; 3503; 24.6; 3. Prague, 343,822; 1601; 18.6. Trieste, 160,825; 1079; 26.8; 1. Brünn, 99,060; 663; 26.8; 1. Cracow, 79,336; 652; 32.9. Presbourg, 58,078; 377; 26.0. Linz, 50,082; 369; 29.5. Copenhagen, 333,714; 1383; 16.6. Stockholm, 259,304; 1052; 16.2. Gothenburg, 111,209; 307; 11.0. Christiania, 167,588; 699; 16.7. St. Petersburg, 954,400; 6035; 25.3; 6. Moscow, 753,469; 7691; 40.8; 1. Warsaw, 515,654; 3654; 28.5; 5. Odessa, 324,500; 2394; 29.5; 7. Turin, 344,203; 1474; 17.1. Venice, 158,159; 817; 20.7. Porto, 139,856; 959; 27.4; 7. Bucharest, 232,009; 1508; 26.0. Cairo, 353,188; 4797; 54.3; 12. Alexandria, 181,703; 2178; 45.7. Damiette, 43,502; 175; 16.1. Suez, 12,406; 164; 52.9; 1. Port Said, 10,693; 190; 71.1.

SANITARY SCIENCE is continuously extending its domain in France. The city of Montpellier has recently given peremptory orders that no article of food shall be delivered by the grocers and butchers of that town unless it is wrapped up in clean wrapping paper, and this new wrapping paper must not be colored.

SHALL SMALL-POX BE PREVENTED?—*Twelve* men in Brooklyn—it is certainly to be hoped there are not many more of the same opinion—have by verdict decided that, in their judgment, it is better for a community during the prevalence of small-pox to allow an expressman or cartman who refuses vaccination to pursue his calling—of freely circulating, collecting, and distributing packages—promotive of the spread of small-pox, than to restrain him of such liberty. This decision, December 13th, 1895, is the result of a suit by William H. Smith against Dr. Z. Taylor Emery, as Health Commissioner of Brooklyn, to recover $10,000 damages for alleged false arrest and imprisonment for twenty-four hours. The suit grew out of the small-pox epidemic of 1894. Smith is a truckman engaged in general trucking. On May 3d, 1894, he alleges he was confined in his premises there for twenty-four hours on the order of the Health Commissioner because he refused to submit to vaccination. Dr. Emery contends that under section 5, title XII. of the charter of Brooklyn, he was empowered to exercise the right to quarantine those subject to infection or to carry the germs of an infectious disease about, if they refused to submit to vaccination in the case of a small-pox epidemic. The conditions of that time, Dr. Emery holds, warranted the action taken. The jury returned a verdict of $489 in favor of the plaintiff.

*As to Violent Vaccination*, another jury, in the Circuit Court, found a verdict of $1500 in favor of Emil Schaeffer against Dr. Henry L. Schelling, of the Health Department, for forcibly vaccinating him against his will. Schaeffer testified that he told the doctor that he did not want to be vaccinated, as he was suffering from a tumor on the brain, and was afraid that vaccination would be dangerous. In spite of his protest, he alleged, the doctor compelled him to submit, using force.

But this was a very different question from that in the case of the action against Dr. Emery. Justice Bartlett, of the Supreme Court, in a case growing out of the same epidemic, expressed a reasonable opinion when he decided, in a case involving the admission of unvaccinated children to the schools, that the school authorities had the right to prevent unvaccinated children from attending school, implying the authority exercised by Dr. Emery, the prevention of unvaccinated peo-

ple from endangering the health of the community by mingling among their neighbors in an infected district. The Health Department certainly has the power to quarantine suspected cases, and to quarantine persons exposed to the disease *if it has satisfactory proof that the exposure has taken place.* Default of this proof appears to have been the only defect in the case of Smith, but the circumstances of the case were thoroughly consistent with the Commissioner's duty in the premises, and will, as we believe, be quite sure to result in justification by the Court of Appeal. The Health Department also unquestionably has power to send its inspectors about the city and to offer vaccination to those willing to be vaccinated ; but the only force justifiable is to those who refuse, if they are known to have been exposed to small-pox, or are by their avocations, as was the case with Smith, the enforcement of quarantine.

DISEASED MEAT IN PROFUSION.—The Medical Health Officer, London, recently seized in Leadenhall Market upward of 200,000 Ostend rabbits, 26,000 of which were putrid, while the others were unfit for human food and had to be destroyed. The port of London sanitary authorities were destroying hundreds of tons of diseased meat every week which found its way to London from Australia and New Zealand.

THE widow of a workingman who died of typhoid-fever last year in Ashland, Wis., has brought suit against the Ashland Water Company for $5000 damages, alleging that the corporation permitted its water to become polluted by typhoid germs, and that her husband's death was due to this pollution.

AN Oklahoma specialist has discovered that a skunk is an excellent disinfectant for diphtheria. It kills all the material upon which the *diphtheria* germ feeds, and doesn't leave it a smell.

"VITAPATHY" should never be used but to denote contempt and disgust. A Cincinnati judge, the other day, in passing sentence on a "vitapath" for practising the "art of healing" without a license, used the following strong, but

eminently appropriate language: "Men who knowingly go into a sick-room and prevent anything being done for a dying man by silly incantations and laying-on of hands are responsible for his death, and ought to be on a par with a murderer in the eyes of the law. God help the dying man who relies upon you or any of the so-called graduates of quackery. You speak of 'vitapathy' being of higher power than medicine, and you say you ordain ministers at the same time you matriculate 'vitapathic' physicians. Your methods are an insult to intelligence; their practice is a criminal abuse of ignorance; and your college is a disgrace to civilization."

THE TREATMENT OF CRIMINALS.—At the recent meeting of the New York State Medical Association, Dr. William A. White recommended the methods pursued in the Elmira Reformatory. He said that out of 7047 criminals received at the Reformatory, 5933 were discharged, and 3638 were considered cured permanently. The methods in vogue at the Reformatory have a tendency to lift the inmates to a higher moral plane.

NATIONAL BUREAU OF PUBLIC HEALTH.—In the House of Representatives, Mr. Mahon, of Pennsylvania, has introduced a bill establishing a Bureau of Public Health in the Treasury Department, to provide measures of security against the introduction of contagious and spread of epidemic diseases.

THE INDEX MEDICUS.—Every progressive physician will be gratified with this notice:

WASHINGTON, D. C., November 27, 1895.

MR. EDITOR: We ask permission to state that the plan proposed for continuing the publication of the *Index Medicus* having been successful, no more subscriptions can be received.

JOHN S. BILLINGS, M.D.,
ROBERT FLETCHER, M.D.,
*Editors.*

SANITARY PATENTS OF RECENT ISSUE SPECIALLY REPORTED FOR "THE SANITARIAN" BY E. S. DUVALL, JR., PATENT ATTORNEY, WASHINGTON, D. C.

543,677. Filter and cooler. G. L. Davis and N. K. Wright, Chicago, Ill.

544,080. Centrifugal filtering machine. G. A. Bachmann, Newark, N. J. Consists of a rotary bowl, provided with an annular bottom supply-channel, a lower tubular shaft, an upper tubular shaft, a partition in the bowl separated from the same at the upper end, a screen surrounded by said partition, and a distributer at the centre of the bowl.

544,140. Filtering pot or urn. W. A. Van Deusen, Brooklyn, N. Y.

544,148. Device for cleaning out tubed wells. H. J. Welter and L. E. Sacksteder, Tiffin, O. Consists of the cylinder formed with a series of holes intermediate its ends and provided at its upper end with a socket and screw plug, of the socket at the lower end of the cylinder, contracted at its lower end, forming a shoulder, the tube fitting therein, the ball valve seated on the upper end of said tube, the nut and the washer clamped between said nut and the socket.

546,844. Apparatus for purifying water. T. Craney, Bay City, Mich. A water supply pipe, an electrolytic pan into which the pipe leads and into and through which the water is fed, an open tank communicating with the pan and into which the water passes from the pan, means for heating the water in the tank, an evaporator and condenser and pipe connection between the same and the evaporator and tank.

546,973. Water purifier. H. E. Gould, New York, N. Y. A top plate formed with apertures, a central perforated tube attached to the top plate, and screw threaded at its lower end, and an apertured block of filtering material placed upon said tube and closed at its ends, a bowl formed with aperture and a cap nut on the lower end of the said tube.

546,739. Filter. O. H. Jewell, Chicago, Ill.

547,547. Water filter. G. B. Hiedeman, Bellevue, Ky. Consists of hemispherical shells, the lower half shell being

divided by perforated concavo-convex partition, forming a water chamber in the bottom thereof and having connections for a pipe to convey the filtered water from said chamber, the upper having its crown perforated, both half shells having annular connecting flanges, and the perforated diaphragm clamped between said flanges.

547,805. Apparatus for unravelling and washing filtering material. C. Pohl and J. Linz, Plauen, Germany.

547,923. Filter. C. W. Isbell, New York, N. Y. A cylinder or filtering material, a surrounding casing provided below the said cylinder with an annular pocket for the collection of impurities and an inlet following the direction of the circumference of the cylinder, and one or more baffle plates arranged across said pocket.

548,018. Well or cistern-cleaning machine. A. M. Taylor, Niles, Mich. A cylinder, fixed bottom, a valve therein, a handle from which the cylinder is suspended, a piston, a double system arms connecting the handle and piston, and a guide-rod pivoted to said arms and reciprocating within said handle.

547,177. Cistern water filter. L. W. Mozingo, Westport, Mo. A filter having a filtering chamber provided with an overflow or supply pipe, a subjacent waste chamber provided with an inverted conical bottom, and a central waste outlet and separated from the filtering chamber by a perforated partition, a receiving chamber arranged above the filtering chamber, a conductor extending vertically from the bottom of the receiving chamber through the filtering chamber to the waste chamber and arranged in alignment with said waste outlet, a spring-supported bucket arranged concentrically in the receiving chamber, a valve arranged in the waste chamber in operative relation with a seat contiguous to the waste outlet and having its stem connected to said bucket and extending through the conductor, a stationary upwardly convexed perforated shield removably fixed in the receiving chamber above and greater in diameter than said bucket, said shield being arranged between the bucket and inlet pipe which communicates with the receiving chamber, whereby its convexed upper surface is exposed to water entering through the inlet pipe and is thereby freed from accumulations of obstructing material

and a siphon communicating with the bucket and adapted to withdraw the water therefrom when the supply is checked.

548,543. Dry or earth closet. H. A. Hecox, Centreville, Mich.

548,254. Garbage furnace. W. Horsfall, Leeds, England. A garbage furnace consisting of an upright tubular boiler of annular shape open at its top, a central hollow and perforated cone arranged within the same, and a rotary grate, occupying the annular space between the cone and the body, said body being provided with an opening located on a level with the grate, for removing the clinker as it is brought opposite said opening by the rotating grate.

548,342. Process of treating garbage. J. Wodiska, New York, N. Y. Consists in pressing the garbage and expelling the liquid therefrom by pressure, then heating the garbage to further expel moisture therefrom, and in then subjecting the garbage to destructive distillation in a retort.

549,062. Filter. A. L. Emery, St. Louis, Mo.

548,958. Process of extracting oil from garbage. T. A. Clayton, New Orleans, La.

549,435. Apparatus for freeing water from scale-producing impurities. S. G. Cabell, Washington, D. C. A cylinder having inlet and outlet ports, perforated partitions, arranged one above another in said cylinder, and balls upon said partitions, said partitions and balls being of electro-negative and electro-positive metals.

549,436. Apparatus for purifying water by galvanic action. S. G. Cabell, Washington, D. C.

549,609. Filter. V. Oster, St. Louis, Mo.

549,755. Domestic garbage dryer. G. Yaylor, Boston, Mass. Comprises a chamber provided with an inlet opening and an outlet opening, and also with openings at other points, a garbage receptacle having perforated sides and open ends mounted in said chamber, one end of said receptacle being arranged beneath certain openings and the other end beneath the others and a trap beneath the lower end of said receptacle.

## OBITUARY.

DR. SAMUEL FLEET SPEIR, fifty-six years old, died December 19th, 1895, at his home, No. 162 Montague Street, Brooklyn, from inflammation and hemorrhage of the stomach, resulting from cancer. He was born in Brooklyn, and was an eminent physician and surgeon and the author of several essays that have commanded widespread attention among his professional brethren. He was graduated with high honors in 1860 from the medical department of the University of the City of New York, carrying off the Mott gold medal and the Van Buren prize. He was formerly Demonstrator of Anatomy in the Long Island College Hospital; subsequently and for many years, to the time of his death, curator, microscopist, and surgeon to the Brooklyn Hospital; surgeon to the tumor and cancer department of the Brooklyn Dispensary. He originated the Seaside Home for Children and founded the Helping Hand, as described by himself in THE SANITARIAN, Vol. XVII., p. 71 (1886), in which he took an abiding interest.

In 1869 Dr. Speir was married to Francis S., daughter of Peter A. Hegeman, of New York City. He leaves an invalid wife and a daughter, who has been with him during his illness.

## NEW BOOKS AND BOOK REVIEWS.

THE SIXTEENTH AND CONCLUDING VOLUME OF THE INDEX-CATALOGUE OF THE LIBRARY OF THE SURGEON-GENERAL'S OFFICE, UNITED STATES ARMY. 4to, pp. 836.

The *first* series of the *Index*-Catalogue, which this volume concludes, will stand as a monument to the liberality of the Government for the promotion of medical science, and to Assistant Surgeon-General, John S. Billings, the editor, for the excellence of the work.

Dr. Billings announces that it is probably the last volume that will be issued under his personal supervision. Nevertheless, the excellence of this series will go far to propitiate the needful Government aid for a subsequent series, and to secure

such competency in conducting it as will add to the honor of the first achievement.

ABBREVIATIONS OF TITLES OF THE MEDICAL PERIODICALS, ETC., used in the Index-Catalogue, Vols. I.-XVI., quarto, pp. 282, is a convenient reference book to all who may have occasion to refer to the full titles, places of publication, etc., cited in the volumes.

PHYSICAL AND NATURAL THERAPEUTICS. The Remedial Use of Heat, Electricity, Modifications of Atmospheric Pressure, Climates and Mineral Waters. By GEORGES HAYEM, M.D., Professor of Clinical Medicine in the Faculty of Medicine of Paris. Edited with the assent of the author, by HOBART AMORY HARE, M.D., Professor of Therapeutics in the Jefferson Medical College of Philadelphia. In one handsome octavo volume of 414 pages, with 113 engravings. Cloth, $3. Philadelphia: Lea Brothers & Co., 1895.

A particularly welcome book comprehending the gist of an immense and still expanding field of practical resources to both curative and preventive medicine, hitherto too much neglected and consequently insufficiently appreciated. Happily the work is by two such accomplished authors as to at once lift the subjects discussed to the highest plane of scientific therapeutics. Georges Hàyem is the well-known editor of *La Revue Médicale Française et Etrangère;* the author of "Leçons sur les modifications du sang sous l'influence des agents médicamenteux et des pratiques therapeutiques," and of several other important books. Professor Hare needs no introduction to students of therapeutics.

The work is divided into six parts.

Part I. considers the effects of respiration in compressed and rarefied air. The inspiration of compressed air is chiefly indicated in cases predisposed to phthisis. It favors the expansion of the lung after the subsidence of a pleurisy and hastens the absorption of exudates. Expiration into rarefied air is useful in emphysema and chronic bronchitis.

Part II. treats of climate. The different factors which go to make up climate—latitude, altitude, geographical position, and wind—are described. The author mentions the principal climates and health resorts of the world and indicates the class of cases for which each is suited. The editor adds a section

of six pages only on American climatic therapeutics to this part, which is good as far as it goes, but it is scarcely sufficient to identify the conditions of a good climate with the excellent description that precedes.

Part III. discusses thermic agents. They effect an exaltation or depression of nervous energy; may be stimulant or tonic, and depressant or sedative. The author states that the naked body can remain indefinitely in an atmosphere of 90° F., but that in order that the conditions be equivalent the (water) bath must have a temperature of 104° to 112° F. Conversely, a bath at 115° F. is hotter and of greater influence than an atmosphere of the same temperature; and it is upon these facts that judgment is based as to the temperature of thermic applications in disease. Of the bath in its various degrees of temperature and mode of use—air, water, vapor, electric, mineral, mud, of every sort—this part is very precise, cogent, and practical.

In Part IV. hydrotherapeutic measures are considered. Logically this section is a continuation of the preceding one.

Part V. is devoted to mineral waters. The various best known springs are described, and the important constituents of the waters given as indicative of their therapeutic value. The author states his own convictions in reference to their effects without regard to popular repute. For example, he declares that syphilitic manifestations of the secondary period are aggravated by sulphur waters; and that chlorosis is treated better at home than at climatic resorts or chalybeate springs. The first thing to do in the latter disease is to impose absolute rest in bed for two or three weeks. The next thing is to insist upon a severe alimentary regimen. The best diet consists of milk and raw meat. Finally, at the end of eight days, when the digestion has improved, iron may be given. He prefers the protoxalate (the oxalate of the protoxide) of iron, which he prescribes in doses of three to six grains at a meal. He says that this preparation of iron does not constipate. At the end of fifteen days or a month the patient may be allowed to get up, and at the end of five or six weeks the cure will be far advanced, if not achieved.

The editor adds a well-written section on American mineral waters, with no pretence to fulness in detail, but comprehend-

ing examples of such as are best known to possess therapeutic values as illustrated by their more important chemical constituents in correspondence with the author's procedure.

Part VI. is devoted to a very complete discussion of electricity, taking up nearly half the book.

As a whole, the work is one of great practical utility, commendable in the highest degree for the lucid statement of the conditions upon which physical and natural therapeutics are founded.

SIXTH ANNUAL REPORT NEW YORK STATE COMMISSIONERS, REPORT IN LUNACY FOR THE YEAR ENDING SEPTEMBER 30TH, 1894. Pp. 700. T. E. McGarr, Secretary, Albany, N. Y.

This report relates to the welfare of the entire insane population of the State, numbering in all about 20,000. It begins with a brief chapter on State care, composed while the change from county to State care was in process under a lively appreciation of the inadequacy of the county system that had hitherto prevailed to a great extent, and a hope for the future. An estimate of the cost of State maintenance follows—$184.84 *per capita.*

The food supplies and dietaries are based upon a daily ration recommended by Professor Austin Flint, after it had been tested by the various hospital superintendents.

As summed up, the number of hospitals and asylums, public and private, for the insane, October 1st, 1894, was 33.

Of 9 State hospitals, number of physicians, 54 ; ratio of physicians to patients, 1 to 171 ; annual per capita cost of medical service, $10.13. Total number of employés, 2171 ; ratio of employés to patients, 1 to 4.26 ; ratio of attendants to patients, 1 to 7.24 ; annual per capita cost of all employés, $63.94.

Total cost of hospitals and asylums to October 1st, 1894, inclusive of exempted county system and licensed private asylums, $23,731,597.09.

The number of committed and registered insane in the State on October 1st, 1894, was as follows :

State hospital system, including insane criminals, 9571 ; exempted New York and Kings counties, 8698 ; licensed private

asylums, 819: 19,088. The total net increase over the preceding year was 736.

Of assigned causes of insanity in 16,208 insane admitted to the hospitals since October 1st, 1888, the preponderating causes were by—

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|---|---|
| Moral causes, including domestic trouble, loss of friends, business anxieties, pecuniary difficulties, grief, fright, disappointed affections, disappointed ambition, political excitement, religious excitement, etc | 13.54 per ct. |
| Intemperance in drink | 8.83 " |
| General ill-health | 6.67 " |
| Hereditary predisposition | 4.40 " |
| Ill-health following overwork | 4.21 " |
| Old age | 3.15 " |
| Masturbation | 2.71 " |
| Physical disease | 1.87 " |
| Climacteric | 1.74 " |
| Traumatic | 1.67 " |
| Sunstroke | 1.37 " |
| Puerperal | 1.24 " |
| Intemperance in drink and narcotics | 1.23 " |
| La grippe | 1.22 " |
| Syphilis | .79 " |
| Mortality during the period | 23.03 " |

Results of treatment under the State system for the fiscal year ending September 30th, 1894.

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|---|---|
| *Recoveries:* | |
| On number admitted | 14.54 per ct. |
| On average daily population | 6.30 " |
| On whole number treated | 4.63 " |
| On number discharged | 19.36 " |
| *Deaths:* | |
| On number admitted | 23.12 " |
| On average daily population | 10.01 " |
| On whole number treated | 7.35 " |
| On number discharged | 30.76 " |

Appended is the second annual report of State Charities Aid Association for the year 1894, giving a retrospect of its

efforts which resulted in amendments to the State Constitution providing for the inspection of all State, county, and municipal institutions which are of a charitable, eleemosynary, correctional, or reformatory character.

THE COMEDY OF SENTIMENT. By DR. MAX NORDAU. 12mo, cloth, $1.50. New York and Chicago: F. Tennyson Neely.

A story of an adventuress, a beautiful, clever, unprincipled woman, divorced from her husband, who desires to maintain her footing in society in order to marry again. The story is well told, but it paints a picture of depravity so devoid of redeeming qualities and so malodorous that, from a sanitary point of view, it is unclean, and therefore not commendable.

PHYSICAL, INTELLECTUAL, AND MORAL ADVANTAGES OF CHASTITY. By DR. M. L. HOLBROOK, editor of *The Journal of Hygiene and Herald of Health.* 12mo, pp. 120. $1. New York: M. L. Holbrook & Co.

A worthy subject, right worthily treated. There is no attempt by the author to appose to the wide and fatal disadvantages of unchastity—universally manifest—but his effort has been to sustain his proposition from its physiological, sanitary, and moral aspects. He has admirably succeeded in his effort. We commend it as an eminently wholesome book worthy of the widest possible circulation.

ON MEMORY AND SPECIFIC ENERGIES OF THE NERVOUS SYSTEM. By PROFESSOR EDWARD HERING. Pp. 50. "The Religion of Science Library" Series. Price, 15 cents. Chicago: The Open Court Publishing Co.

The elaboration of an address delivered before the Imperial Academy of Science, at Vienna, comprehending the most recent knowledge on the functions of the brain.

HOW TO DISINFECT: A Guide to Practical Disinfection in Every-day Life, and During Cases of Infectious Illness. By C. T. KINGZETT, F.I.C., F.C.S. Price, 10 cents. American and Continental "Sanitas" Co., 636–642 West Fifty-fifth Street, New York.

An interesting and instructive pamphlet on the use of "*sanitas*" products and preparations in various forms; adapted to use in the sick-chamber; as ointments to the body in cases of contagious exanthems; infective secretions and discharges; as gargle in throat diseases, particularly in diphtheria; surgical dressings, etc., and to premises, drains, closets, and roundabout for the destruction of disease germs and to prevent the spread of epidemic diseases.

REPORT OF THE COMMITTEE ON HYGIENE TO INVESTIGATE THE WATER, ICE, AND MILK SUPPLIES OF BUFFALO, Charles G. Stockton, M.D., Chairman.

A pamphlet of 30 pages of practical importance to all municipal communities and sanitary authorities who would protect the health of the people.

IMPROVED PUBLIC BATHING FACILITIES adopted at Brookline, Mass., as reported and urged by a committee, of which H. Lincoln Chase, M.D., Health Officer, was pioneer and chairman, is a commendable pamphlet of 10 pages worthy of wide dissemination.

OF NEW PERIODICALS that have recently come to our table, CLIMATE AND HEALTH is foremost. Issued by the United States Department of Agriculture, edited, under the direction of Professor Willis L. Moore, Chief of the Weather Bureau, by W. F. R. Phillips, M.D. At this writing we have received the three first numbers—for July, August, and September—of increasing interest in the fulfilment of its purpose: to keep the sanitary conditions throughout the various States of the Union constantly before the public.

The data that appear in its climatic charts and tables are taken from the records of selected stations of the meteorologic observations of the Weather Bureau. The statistics of mortality and morbility are furnished by special reports of public health officials and of physicians made directly to the Weather Bureau, and some from the Abstract of Sanitary Reports of the Marine Hospital Service. These observations are shown on charts, and the statistics in tables in weekly summaries.

Besides the exclusive climatic charts, weekly, other charts show the total mortality by States, with average climatic conditions in conjunction. Summed up: In the four calendar weeks that terminated September, 1895, in an average population of 12,890,482, for each week, there were 18,867 deaths from all causes, representing a death for the entire country of 19.0 per 1000 per annum; 44.3 per cent were of children under five years of age. The mortality from particular diseases is alike easily traceable.

THE AMERICAN JOURNAL OF SOCIOLOGY, of which we have received No. 1 only, for July, announced as a *bi-monthly* at $2 per annum. It purports to supply the need of means of correlating investigation in the specific sciences: an admirable purpose that ought to meet with generous encouragement.

This number contains: The Era of Sociology, editorial; The Place of Sociology among Sciences, L. F. Ward; Is Our Republic a Failure, Harry Pratt Judson; The Relation of Anthropology to the Study of History, George E. Fellows; English and American Christian Socialism, Paul Monroe; Christian Sociology, Shailer Matthews; The Civic Federation of Chicago, Albion W. Small; and Seminar Notes.

Editor, Albion W. Small, with half a dozen associate editors, and a promise of the names of American and European advising editors in the succeeding numbers. The financial responsibility for it is assumed by the University of Chicago, to whom all remittances should be made payable.

TEXAS MEDICAL NEWS, monthly, Vol. V., No. 1, November, 1895, is a change of base from the whilom *Texas Sanitarian*, by the same administrators, at Austin, Tex., and at the same burial rate, $1 a year. It is, in truth, No. 1 of *Vol. I., first* issue. "Devoted to the interests of the medical profession of Texas and the Southwest"—"(Formerly *Texas Sanitarian*)"! *The Texas Sanitarian* was devoted to "the dissemination of sanitary principles and news, and to popular hygiene." We regret its demise, and the more for its being succeeded by an addition to the already excessive number of one-dollar medical monthlies. Whether this one can afford to be better than others of the same grade, or more

successful than *The Texas Sanitarian*, on whose estate it administers, is an open question. This number, however, compares favorably.

PEDIATRICS, Vol. I., No. 1, pp. 48, $2 a year, semi-monthly. Van Publishing Co., 1432 Broadway, New York; John Bale & Sons, 85–89 Great Litchfield Street, W. London. This first number is filled with excellent matter. The first article, by A. Jacobi, M.D., on Infant Feeding, is alone worth the subscription to any practitioner who would be abreast with the advance of knowledge on the most important means of preserving the lives of infants.

AMERICAN MEDICAL REVIEW. A monthly review of current medical literature. Daniel Lewis, A.M., M.D., editor. The R. N. Plummer Co., Publishers, 108 Fulton Street, New York. Pp. 64. $1 a year. Special features: Progress of Medical Science; A Monthly Index Medicus of Leading Current Medical Literature; Editorials on Timely Topics; Professional Opinions and Interviews; New Remedies and Treatment; Reports of Medical Society Proceedings, and Reviews. This first number is an excellent example illustrating a well-digested plan, and highly commendable.

CLEVELAND JOURNAL OF MEDICINE, to be the official journal of the Cleveland Medical Society, is announced; to succeed the *Western Reserve Medical Journal*, to retire, Henry S. Upson, M.D., and P. Maxwell Foshay, M.D., Editors and Proprietors. "It will aim impartially to represent the whole profession of the State." P. Maxwell Foshay, M.D., Business Manager, 282 Prospect Street, Cleveland, O.

ADVANCE IN EDUCATION. A Magazine devoted to the Conservation of the Individual in Mass Education, and the Essential Principles of Educational Unity. Edited by P. W. Search. Bi-monthly, pp. 28, double column. $2 a year, in advance. Los Angeles, Cal.

The initial number, November, is excellent. If equalled by future issues it will doubtless speedily secure patronage.

## LITERARY NOTES.

AMONG the entertaining books recently announced by Harper & Brothers is "A Study of Death," by Henry M. Alden, author of "God in His World." The extraordinary success of Mr. Alden's previous book, which was pronounced "the *most* successful work of religious thought of the season," and "the most noteworthy book of a religious kind (in style as well as in substance) published in England or in America for many years," insures a suitable reception for "A Study of Death"—a book wholly uncommon, spiritual, hopeful, and important.

THE INTERNATIONAL MEDICAL ANNUAL for 1896 is announced to be well under way, and to be issued soon, being the fourteenth yearly issue of this eminently useful work. Since the first issue of this one volume reference work, each year has witnessed marked improvements; and the prospectus of the forthcoming volume gives promise that it will surpass any of its predecessors. It will be the conjoint authorship of forty distinguished specialists, selected from the most eminent physicians and surgeons of America, England, and the Continent. E. B. Treat, Publisher, New York.

KEIL'S MEDICAL, PHARMACEUTICAL AND DENTAL DIRECTORY. George Keil, Editor, Philadelphia, announces the early publication (fourth edition) of "Keil's Medical, Pharmaceutical and Dental Register-Directory and Intelligencer," for Pennsylvania, New York, New Jersey, Maryland, Delaware, and District of Columbia. Its list of national colleges, State hospitals, homes, dispensaries, societies, and post-office addresses of physicians, druggists, and dentists, school of graduation and year, all the latest laws in these States, will be complete to date of issue, as a personal canvass will be made for data. It is the only directory published for above-named States, registering graduates of all schools, physicians, druggists, and dentists, and imparting all information needed by the professions mentioned in their daily practice. Burk & McFetridge Co., 306 Chestnut Street, Philadelphia, Pa., Publishers.

## CONTEMPORARY LITERATURE.

HEALTH EXPERIMENTS IN THE FRENCH ARMY.—Among the soldiers under the military government of Paris there were 824 typhoid cases in 1888. The following year the number increased to 1179. At that time the water of the Vanne was substituted for the contaminated Seine water. The cases of the next four years numbered, respectively, only 299, 276, 293, and 258. Last year the Vanne itself became contaminated through an accident, the history of which has been traced conclusively. The result was an increase of typhoid cases in the Paris garrison to 436, of which 310 occurred in the three months of February, March, and April. During January and February of the present year (1895) there were only eight cases in all.

The fact that typhoid-fever comes and goes with impure drinking water could hardly receive a more striking demonstration. Yet the possibility has been realized in the experience of Melun, a garrison town of about 12,000 inhabitants, situated on the Seine, 28 miles above Paris. Here, in 1889, there were 122 cases of typhoid-fever among the soldiers. The Chamberland filters (Pasteur system) were then introduced, and the cases of the following years numbered, respectively, 15, 6, 2, 7, and 7 again for 1894. Suddenly, during the severe weather of February of this year, 28 dragoons, one after the other, came down with the fever. The infantry battalion, living in the same barracks, had not a single case. The secret was soon out. The filters had been allowed to freeze and the soldiers were ordered to drink only the weak infusion of tea furnished them, in which, of course, the water was boiled. The dragoons had simply not obeyed, but had helped themselves to the Seine water from the hydrants.—STODDARD DEWEY, *in Appletons' Popular Science Monthly for December.*

A NEW biography of George Washington, by Professor Woodrow Wilson, of Princeton, will be a feature of *Harper's*

*Magazine* during 1896. The first paper, which appears in the January number, treats of the conditions of the colonies, with especial reference to Virginia at the time of Washington's birth. The paper is fully illustrated with the earliest known portrait of Washington, five drawings by Howard Pyle, and other pictures.

THE REVIEW OF REVIEWS for December, in its "Progress of the World" department, plunges as usual into the discussion of important current topics. The assembling of the Fifty-fourth Congress, at home, and the disturbed condition of Turkey and some of the European powers at this moment present questions which call for extended comment this month. The editor also devotes several paragraphs to the boundary dispute between Great Britain and Venezuela, and the results of the recent elections in various States are reviewed and summarized. But this department of the *Review* is by no means confined in its range to political or governmental affairs; it "covers" such subjects as the foundation of the Luther League of America, the doings of Schlatter, the so-called "Healer," in Denver, noteworthy events in the educational world (Mr. Rockefeller's latest gift to the University of Chicago, the inauguration of a new president at Colgate University, etc.), and biographical notes on important men and women who have died during the month (Eugene Field, Signor Bonghi, and others).

"THE BELOVED PHYSICIAN."—St. Paul, you know, was a man in quite delicate health, and it was a great comfort to him to have always near him a skilled doctor like St. Luke. It was enough to make him love him. This epithet, however, was one which St. Paul evidently knew those to whom he was writing would understand when he called his doctor "beloved." That was the way, doubtless, in which people generally spoke of him, and is there anybody who is more loved in a family than a truly sympathetic and competent doctor? I have had, as president of a large hospital, a great deal to do with doctors, and while they have weaknesses (no more than priests have), I wish to say that I have never found any body of men more unselfish and more eager to benefit

humanity. A doctor does more charitable work, and gives more time to the poor than any other man, and I have been often greatly touched to see the hours on hours of the most exhausting labor which a doctor, whose time was gold, would give to some poor colored girl who could not pay a cent. Do not sneer, as the devil did when speaking about Job, and say: "He does it to get more skill and because it is an interesting case." He does it nine times out of ten because he wishes to relieve suffering, and that is a trait in which he draws very near his Lord. That St. Luke had the pet name of "the beloved physician" speaks volumes for him, and shows him to have been a man of sympathy and skill, a loving, kind-hearted, and genial doctor, and there are no better citizens and companions than that sort of physicians.—*From the* REV. DR. CLINTON LOCK'S, "*Five Minutes' Talk*," *in the Living Church, October 19th*, 1895.

MUSIC AND RELIGION.—It was a remark of Mendelssohn that there are two subjects which are too sacred for discussion—religion and thorough-bass.

Religion and music are not only alike sacred, but they touch at so many points that they can hardly be separated, and in their higher ranges they melt into one. There are debased forms of music that have no suggestion of religion, and there are debased religions that do not call for music; but when each is worthy of its name they pass into each other as by creative affinity.—"*Music, Heavenly Maid*," *by* T. T. MUNGER, *in December Century.*

THE INFLUENCE OF PICTURES IN THE HOUSE.—The real location of a city house depends upon the pictures which hang upon its walls. They are its neighborhood and its outlook. They confer upon it that touch of life and character, that power to beget love and bind friendship, which a country house receives from its surrounding landscape, the garden that embraces it, the stream that runs near it, and the shaded paths that lead to and from its door.

By this magic of pictures my narrow, upright slice of living-space in one of the brown-stone strata on the eastward slope of Manhattan Island is translated to an open and agreeable

site. It has windows that look toward the woods and the sunset, water-gates by which a little boat is always waiting, and secret passageways leading into fair places that are frequented by persons of distinction and charm. No darkness of night obscures these outlets; no neighbor's house shuts off the view; no drifted snow of winter makes them impassable. They are always free, and through them I go out and in upon my adventures.—*From "A White Blot," by* DR. HENRY VAN DYKE, *in the Christmas* (*December*) *Scribner's.*

OUR ADVANCING PHYSICIAN.—Great are the achievements of contemporary science in the department of therapeutics. Just now the medical novelty seems to be the pursuit of the microbe. It is carried on with an ardor that sometimes makes both laymen and doctors smile. One hears such stories as that of a man who went to his physician with a slight sore throat, left a little of the lining of it to be examined, got a gargle, and went home. That night he went to the theatre, but was called out in the middle of the performance and told that the membrane from his throat had diphtheritic microbes in it, and that he must go home, which he did; but all the folks with sore throats in the audience who happened not to have seen a physician staid the show out.—*Harper's Weekly.*

MORBUS SABBATICUS, or Sunday sickness, according to a recent description published in the *Churchman*, is distinguished by the following characteristics: "1. That it only attacks members of the Church. 2. It never troubles them any day but Sunday. 3. The symptoms vary, but the patient can always sleep well the night before, and can always eat a hearty Sunday dinner shortly after an acute attack. 4. No case was ever known where the sick man was not able to be at his business early Monday. 5. It is generally the head of the family that is attacked 6. When ladies are affected there will generally be found a complication with the dressmaker who failed to send the new garment Saturday, or with a perfect fright of a bonnet. 7. In this disease no physician is summoned. 8. It never hurts the body, but it slays souls.

AN ENTHUSIAST is a kind of freshet that will do a good deal in a given time that is more or less to the purpose, but cannot be counted upon for steady effects, and when it is passed leaves things in that miscellaneous condition that postpones for a considerable time the resumption of anything like steady work. The objection is not to the enthusiasm *per se*, but to its friskiness. It is open to the same criticism that the Northern lights would be, considered as a means of street illumination. . . .

The criterion of the amount of effect that a man will be likely to produce in the world will be not the brilliancy or the impetuosity with which he takes hold, but the holy doggedness with which he hangs to after he has taken hold.—*Dr. Parkhurst.*

THE HOME JOURNAL admirably holds its own as *the* Society Journal in the best sense of the term ; for, besides being the exponent of the Literary and Art Culture of our home metropolis, by its foreign correspondence it keeps its readers *en rapport* with all that is best worth recognition in social life abroad.

A SUCCESSFUL MOTTO.—One of the life agents of a large old liner in this territory (*Indicator*, of Detroit), who has had considerable trouble in the way of not taken policies, etc., has served notice on his agency forces of the adoption of a motto which we can commend especially for its brevity (?) ; the literary tendency of the gentleman in question will in a measure, however, account for his temporary flight from the well-beaten paths. The motto follows :

"I'd rather be a healthy tramp
Than be a weak, consumptive king ;
I'd rather be a flying crow
Than eagle with a broken wing ;
I'd rather be a man of peace
Than hero brave when guns are banging ;
I'd rather be a lookeron
Than the 'best man' at a hanging."

FUNK & WAGNALLS' STANDARD DICTIONARY.

Our attention is invited to a very grave wrong against the American public by a reprinter of one of the English com-

petitors of the Funk & Wagnalls' Standard Dictionary—a wrong that cannot be excused by the exigencies of commercial rivalry. As is well known, in all unabridged dictionaries it is necessary to give the definitions of certain indelicate words. Eighteen of these words (selected out of a vocabulary of over 300,000 terms in the Standard) have been collated and printed with their definitions by the reprinter of this English dictionary, and circulars containing them are being distributed among teachers, school trustees, and parents all through this country, stirring up a filthy agitation that will end, unless frowned down by the public press and other leaders of public opinion, in setting people of prurient minds and children everywhere to ransacking dictionaries for this class of words.

In evidence of the utter insincerity of this attack on the Standard, it appears that fifteen out of the eighteen words (and others of the same class) are, and properly so, in the Century Dictionary, and they are to be found, with scarcely an exception, in every other reputable unabridged dictionary, and this class of words is invariably recorded in the leading dictionaries of all languages.

Since this gross attack has been made, the publishers say they have submitted to Charles A. Dana and to a number of well-known educators the question whether they committed an error in admitting into the Standard this class of words. The answer has been without an exception, "You did not."

## PUBLICATIONS RECEIVED.

Proceedings of the Third Annual State Sanitary Convention of California. J. R. Laine, M.D., Secretary, Sacramento.

Bulletins of Department of Agriculture, Washington, D. C.:

Investigations concerning Infectious Diseases among Poultry, by Theobold Smith, Ph.B., M.D., and Veranus A. Moore, B.S., M.D.;

Nutritive Value and Cost of Foods, by W. O. Atwater, Ph.D.;

The Feeding of Farm Animals, by E. W. Allen, Ph.D.;

Barnyard Manure, by W. H. Beal.

Recent Measures for the Prevention and Treatment of Tuberculosis. Guy Hinsdale, M.D., Philadelphia.

# THE SANITARIAN.

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## CUBA A MENACE TO THE UNITED STATES.

### YELLOW-FEVER AND LEPROSY.*

By GEORGE TROOP MAXWELL, M.D.

THE estimate one attaches to health and life is the measure of the value he places upon the science of hygiene, that branch of medicine which treats of the preservation of health by the prevention of disease.

Perhaps no higher evidence of the civilization and enlightenment of a people can be afforded than is exhibited by the measures employed for the protection of health. Though as old as history, hygiene had received little attention either in Western Europe or the United States until during recent times. Now, however, it is a subject of commanding interest, and engrosses the attention of the learned and the humane in every walk of life.

So true is this that the distinguished Professor Syme declared that erelong the medical profession would be divided into surgeons, obstetricians, and hygienists, implying that the practice of medicine will be assigned a subordinate place in the minds and activities of the medical profession.

With these ideas in mind, I purpose to call your attention to a subject of transcendent importance, as it relates to the Union in general, and to the State of Florida in particular, involving, as it does, the protection of the inhabitants of this country from the invasion of a disease which history attests has always been regarded as the most to be dreaded.

While in common with all lovers of liberty, I would be pleased to see the Cubans successful in their efforts to throw

* Paper read on retiring from the Presidency of the Duval County Medical Society, Florida, January 7th, 1896.

off the yoke of tyranny, and to this end favor the recognition of their belligerent rights by the Government of the United States, there is an aspect of the question of actual, positive interference in the affairs of that island which, though devoid of sentiment, has a practical application of vital importance to the people of this country.

It is no less trite than true that "self-preservation is the first law of nature." The highest interest of the inhabitants of this country, that which involves the preservation of health and the protection of life, demands the interference of the United States in the governmental affairs of the island of Cuba.

Spain's interest in Cuba, aside from the sentimental idea of retaining her colonial possessions intact, is simply and entirely sordid. It is with Spain a question of revenue of dollars and cents simply. The welfare and happiness of her subjects are secondary to that, and in consequence the health conditions of Cuba give her little or no concern; but to the inhabitants of this country the importance of this latter question cannot be overestimated.

Cuba, because of her proximity and commercial relations, is regarded as the point of danger to the Union, as it relates to that bugbear of modern times—yellow-fever. Millions of dollars have been spent in efforts to prevent its intrusion into the States.

While my knowledge of that disease—its history and nature—forbids assent to the commonly accepted notion that it is contagious, I am in complete accord with those who hold that its persistent prevalence in Cuba is attributable to the utter disregard of the simplest principles of hygiene.

That it is due to local unsanitary conditions in Havana and Rio Janeiro has been declared with great emphasis by men who, from official position, if for nothing else, will give the weight of authority to their dicta.

Dr. Hamilton, in his last report as Surgeon-General of the Marine Hospital Service, 1890, said: "The United States would be the gainer, even in a pecuniary sense, if she were to donate to the Cuban Government sufficient funds to make Havana a healthy seaport. Yellow-fever is almost always present in Havana and Rio Janeiro, but it is beyond question

that those cities could be made clean and healthy if proper measures were taken." And Dr. Sternberg, Surgeon-General of the United States Army, said: "It is not too much to say that by well-executed sanitary measures the endemic plague so fatal to strangers could be entirely banished from this beautiful city (Rio Janeiro)."

Dr. Benjamin Lee, the learned Secretary of the State Board of Health of Pennsylvania, in a paper read before the American Public Health Association, 1889, said: "But that the presence of this contagion in Havana is not a necessity is demonstrated by the fact that in other parts of the island, where the thermal mean is still higher, the disease is rarely seen. All intelligent observers agree that were a proper and comprehensive system of drainage introduced, by which the feculent and other putrefiable material, which now pours by thousands of gallons daily into this landlocked pond, should be transported to a considerable distance out of the mouth of the harbor, and there deposited in the open sea; were all cesspools and privies abolished, their contents thoroughly disinfected and removed, and the filth-sodden soil surrounding them excavated and replaced by clean earth, yellow-fever in Havana would soon be a thing of the past, and the island would become a noted health resort rather than a plague-spot. Spain," he says, "has never looked upon Cuba as anything but an orange to be sucked." And he adds: "The only hope of improvement is in an entire change of government."

This is corroborated by men high in authority and distinguished for learning, the view I entertain and have frequently asserted, that yellow-fever is a disease of local origin, due to circumscribed unsanitary, but removable conditions, into which climatic influences do not enter; and by implication, at least, they confirm another of my convictions—that it is the right and the duty of the United States Government to intervene for the protection of our people.

But there is a disease of wide prevalence in Cuba that is vastly more horrible in its effects, and much more dangerous to the inhabitants of this country than yellow-fever. I refer to leprosy.

The yellow-fever patient is confined to bed or to the house, and cannot communicate with others, except as they go to

him. Even if the disease were contagious, only his attendants and visitors would be exposed to the contagion; but the leper, the subject of an undoubtedly contagious disease, has the power to associate with others, to go from place to place, from country to country, till mutilation renders locomotion impossible.

Leprosy is the most loathsome of all diseases. It disfigures, deforms, mutilates; and, covered with putrescent ulcers, its subjects are both disgusting and dangerous. Leprosy is insidious in its invasion, protracted in duration, communicable by sick to well, transmissible by heredity, and is certainly fatal. Such is the nature of a disease which is widespread in Cuba, there being about one thousand cases on the island, and which has already obtained a foothold in the United States at Key West, the point nearest to and in most continual communication with the island.

Dr. Lee, already quoted, who personally investigated the subject, said: "When one walks the streets of Havana with a watchful and discerning eye, he finds a leper at every turn. It may safely be said that there is no business in which they are not engaged. Stopping to buy a newspaper of a man sitting on a street corner, the paper was presented to me between two mutilated stumps of wrists, the hands having been entirely eaten off. On the next corner was an old leprous woman selling cheap confectionery. A well-known bookseller has for years been a leper. A proprietor of one of the hotels is a sufferer. One can be shaved by a leprous barber. Undoubtedly many lepers are employed in the cigar factories. . . . While sitting at dinner in one of the finest hotels of the city, close to a window opened to the floor, and separated from the street only by an open iron grating, I heard a plaintive, muffled voice close to my ear. Looking around, what was my horror and disgust to see a fingerless hand thrust through the bars for alms, not twelve inches from my plate. And so it is that in every relation of life one is confronted with the evidences of the general distribution of this horrible, incurable disease among the people. Leprosy is absolutely unrestricted in this island. The ravages of the disease are confined to no class or race. It has but one history, that of constant progression, unless checked by isolation of the most

absolute and unrelenting character. No centre of leprosy has ever originated in the United States. The importation of the first of a series of cases can always be traced."

Dr. Morrow, of New York, who has made special study of the distribution of leprosy in this country, in a lecture before the Public Health Association, said: "At Key West . . . there have been reported over one hundred cases of a comparatively recent development."

What aroused my interest in this subject at this time is a communication recently received from a reliable source, which contained the following information: "There are eighteen cases of leprosy at large in the town of Key West, four of whom have married and have young families, thus transmitting the disease by heredity as well as by social intercourse."

The following resolution, introduced by Dr. Lee, was adopted by the American Public Health Association:

"*Resolved*, That this Association respectfully requests Supervising Surgeon-General Hamilton, of the United States Marine Hospital Service, the honorable chief of the State Board of Health of Florida, and all quarantine commissioners of ports having intercourse with Cuban ports, to exercise the same vigilance with regard to leprosy that is observed in the case of yellow-fever."

Key West is the home of the State Health Officer, and of a representative of the Marine Hospital Service; but if my information is correct, neither the State nor the national official has taken a step toward affording protection to our State and the Union from this horrible, contagious, incurable disease. Lepers still stalk abroad over the island of Cuba and in the streets of Key West, to convey and communicate the disease to the well, and to intermarry with healthy persons to transmit it to posterity.

Dr. Lee said: "The authorities at Tampa are taking the alarm, and have sent two cases back to Cuba under a clause of the emigration law." To verify the statement and to learn the particulars, I addressed a note, on the 13th ult., to Dr. Leslie Weedon, the city Health Officer of Tampa, asking for the facts. In his reply he said he had referred my letter to Dr. Porter, State Health Officer, "who alone can answer your questions." I have not heard from Dr. Porter.

In view of the necessity for protection of our people from this pestilence—which slowly but surely works destruction—which Spain will not give, is it not the duty of the United States Government to intervene, by force if need be, and to afford security to Americans from a danger, the effects of which are more horrible than the ravages of war?

In no part of the Union could a movement looking to this important end be inaugurated with as great propriety as in Florida, and to the dicta of no class of her population would as great weight be attached as to a pronouncement from her medical faculty.

## TOPOGRAPHY, CLIMATE, AND MINERAL SPRINGS OF ALABAMA.

By A. N. Bell, A.M., M.D.

Alabama comprehends an area of 50,250 square miles, of nearly rectangular shape, lying between the parallels of 30° 10′ and 35° north latitude, and the meridians of 84° 56′ and 88° 48′ west longitude from Greenwich. The area widens a little from its northern boundary by Tennessee, as it extends toward the southeast and southwest to its boundary by Florida on the south, by about three fourths of the width, 50 miles north of the Gulf. The other fourth projects, between Florida on the east and Mississippi on the west, to the Gulf coast-line, grasping in its centre Mobile Bay and its tributaries.

The surface of the State is generally level, except a portion of the north, through which the Blue Ridge extends, but nowhere attains any great elevation; but the broken and rugged surface extending from the foot of the mountains, succeeded by elevated hills southward and through the central portion of the State, present many picturesque views and some wild and romantic scenery. The surface gradually slopes, however, until it reaches the vicinity of Mobile Bay, less than 100 miles from the Gulf, where it becomes nearly level and but a little above the surface of its waters.

The principal rivers are the Tennessee, the Mobile, Tombigbee, Alabama, Coosa, Black Warrior, Perdido, and Chattahoochee, all of them except the Tennessee having many

affluents. The Tennessee sweeps entirely across the northern section of the State, from the northwest to the northeast corner, forming an irregular curve at Guntersville, about 40 miles south of the northern boundary line. It receives no tributaries of consequence on its southern side, and only three small streams—Elk, Flint, and Paint Rock rivers—on the northern side in its course through the State. The Chattahoochee is a large stream, but with no considerable tributaries in the State. It forms part of the eastern boundary and discharges its waters in the Gulf. The Escambia and Choctawhatchie rivers, with their affluents, drain a portion of the southern part of the State and discharge their waters into Pensacola and Choctawhatchie bays, on the Florida coast; but much the greater part of the drainage of the State is effected by the Mobile River and its tributaries—the Tombigbee, the Alabama, the Coosa, the Cahawba, the Tallapoosa, and the Black Warrior rivers, which chiefly constitute the headwaters of Mobile Bay. The Tombigbee, coming from Mississippi, receives the waters of the Black Warrior, and at 50 miles above Mobile Bay unites with the Alabama, it being already the affluent of the Coosa, the Tallapoosa, and the Cahawba. After the junction of the Tombigbee and the Alabama, the united rivers become the Mobile River. The Tensaw River, a considerable stream, unites by natural canals with both the Alabama and the Mobile rivers, but finally makes its way as an independent stream, parallel with the Mobile, and discharges its waters into Mobile Bay. The Black Warrior and the Alabama rivers are navigable for light draft steamers for 300 miles. The Tensaw, Chattahoochee, Tennessee, and Perdido are also navigable by light draft for a considerable distance. Altogether the extent of steamboat river navigation in the State is about 1500 miles. Mobile Bay, the main outlet of the navigable waters of the State, in the extreme southwestern portion of the State, is about 30 miles long and from 3 to 8 miles broad, and has 15 feet of water at low water in its main channel. The smaller bays—Grand, Bonsecours, and Perdido—are shallow and of but little commercial importance.

Extending over 4° to 5° of latitude, and to a point within 7° of the tropics, Alabama combines the vegetable products

of both the temperate and semi-tropical regions. In the north the white, red, pin, and post oak; the hickory, chestnut, poplar, cedar, elm, mulberry, magnolia, and pine are the principal forest trees. Below latitude 33° the forests begin to assume a more semi-tropical character, with an abundance of live oak and other large trees festooned with moss. Further south still there are extensive canebreaks over large and almost impassable tracts studded with gigantic cedars, cypress, and other large trees of sombre foliage towering above the jungle.

Fruit-trees, shrubbery, and vines are abundant. Grapes, apples, pears, plums, peaches, and small fruits more or less throughout the northern portion of the State; and figs, pomegranates, olives, oranges, etc., in the southern portion.

THE CLIMATE varies with latitude and elevation. In the northern section the climate is delightful and healthful. The temperature seldom below 32° F. in winter, and in summer the elevation is sufficient to prevent the sweltering heat of the lowlands of the Southern States in the same latitude. Huntsville and Florence, on the Tennessee River, are favorite resorts for invalids, and but rarely subject to the malarial diseases common to the valleys on some of the other rivers and the lowlands of the southern section. Annual mean temperature for a series of years in the central counties, 62° F.; and the range from 20° to 105°. At Montgomery, with the thermometer 34 feet above the ground, annual mean, 64.5°; summer, 81.8°; winter, 47.4° At Mobile, thermometer 64 feet above the ground, annual mean, 65.6°; summer, 81°; winter, 50.3° —range, 20° to 81°.

Annual mean relative humidity, at Montgomery, 65.7°; summer, 65°; winter, 72.8°. At Mobile, annual, 73.8°; summer, 76°; winter, 73.6°.

In the southern counties, in default of soil drainage and an abundance of pure water, malarial diseases prevail more or less throughout the year, and in summer and autumn malignant fevers are not uncommon. Of the water supply, in the northern and for the most part in the central portion of the State, the wells and springs furnish an abundance of the very best quality, but in the southern portion the only safe dependence is on that which is obtainable from artesian wells.

Mobile is a delightfully situated city on a sandy soil, on the western shore, at the head of Mobile Bay, in the midst of

a pine woods growth round about. It *ought to be*, what it has too often been said to be, and would be one of the most healthful cities of the country, but for the neglect of soil drainage and sewerage. The city is for the most part located but a few feet above the level of the Gulf, at the foot of a plateau which rises to the height of 300 feet, affording a delightful tableland residence, overlooking the Bay and open to the sea-breezes from the Gulf all the year round.

These winds, in the winter time particularly, are sometimes loaded with moisture, but *it* is clean moisture that is not liable to make people sick, like that which hovers over the low and undrained soil of the shore. On the eastern shore of the Bay and nearer the Gulf there are several watering-places of excellent repute, to which the better-to-do people of Mobile, who do not live on the plateau, and many people from the neighboring cities in the Gulf region resort for health and pleasure in both summer and winter. Alabama City, Williamsburg, and Point Clear, situated from 15 to 20 miles from the city, are all well appointed with regard to hotel accommodation, bathing, and boating facilities; with cottages and orange groves round about, available for invalids; or for pleasure-seekers, who would make a long sojourn and enjoy the attractions of fishing and hunting. The waters, fields, and forests are all alive with game. Quail are abundant in the meadows, ducks on the creeks and coves of the Bay, and wild turkeys in the forests; and those who would hunt deer will not fail to bounce them, even when seeking quail and turkeys.

THE MINERAL SPRINGS are as follows:

Bladden Springs, Choctaw County.

Vichy Spring. J. L. and W. P. Riddell, analysts.

*Alkaline.*

| | | | |
|---|---|---|---|
| Sodium carbonate, | grains per gallon | ..... | 46.33 |
| Magnesium carbonate, | " | " ..... | 0.29 |
| Calcium carbonate, | " | " ..... | 0.87 |
| Iron carbonate, | " | " ..... | 0.49 |
| Calcium sulphate, | " | " ..... | 2.25 |
| Organic matter, | " | " ..... | 2.26 |
| Total | " | " ..... | 52.49 |
| Gases: | | | |
| Carbonic acid, cubic inches | | ..... | 65.44 |
| Chlorine, " | " | ..... | 1.84 |

Branch Spring. J. L. and W. P. Riddell, analysts.

*Alkaline.*

| | | | |
|---|---|---|---|
| Sodium carbonate, | grains per gallon | | 41.21 |
| Magnesium carbonate, | " | " | 0.61 |
| Calcium carbonate, | " | " | 2.14 |
| Iron carbonate, | " | " | 0.23 |
| Calcium sulphate, | " | " | 2.79 |
| Organic matter, | " | " | 1.90 |
| Total | " | " | 48.88 |
| Gases: | | | |
| Carbonic acid, | cubic inches | | 59.20 |
| Chlorine, | " | " | 1.84 |

Sulphur Spring. J. L. and W. P. Riddell, analysts.

*Alkaline-Sulphuretted.*

| | | | |
|---|---|---|---|
| Sodium carbonate, | grains per gallon | | 34.93 |
| Magnesium carbonate, | " | " | 0.65 |
| Calcium carbonate, | " | " | 2.42 |
| Iron carbonate, | " | " | 0.76 |
| Calcium sulphate, | " | " | 2.96 |
| Organic matter, | " | " | 1.25 |
| Total | " | " | 42.97 |
| Gases: | | | |
| Carbonic acid, | cubic inches | | 52.88 |
| Sulphuretted hydrogen, | " | " | 0.56 |
| Chlorine, | " | " | 1.84 |

Old Spring. R. T. Brumby analyst.

*Saline.*

| | | | |
|---|---|---|---|
| Sodium carbonate, | grains per gallon | | 32.89 |
| Magnesium carbonate, | " | " | 1.36 |
| Calcium carbonate, | " | " | 2.75 |
| Iron carbonate, | " | " | 0.02 |
| Iron sulphate, | " | " | 0.24 |
| Sodium chloride, | " | " | 7.69 |
| Strontia, | " | " | 0.32 |
| Silica, | " | " | 2.10 |
| Crenic acid, | " | " | 0.73 |
| Hypocrenic acid, | " | " | 0.60 |
| Total | " | " | 48.70 |
| Carbonic acid gas, | cubic inches | | 32.56 |

Cullum's Springs, near Bladden's, Choctaw County.

Alabama Vichy Spring. Abequin, analyst.

*Alkaline.*

| | | |
|---|---|---|
| Sodium bicarbonate, Potassium bicarbonate, | grains per gallon | 65.40 |
| Magnesium bicarbonate, Calcium bicarbonate, | " " | 6.49 |
| Iron bicarbonate, | " " | 0.37 |
| Sodium sulphate, Magnesium sulphate, | " " | 2.46 |
| Sodium chloride, | " " | 4.54 |
| Silica, | " " | 1.40 |
| Sodium silicate, | " " | 1.57 |
| Sodium iodide | | trace. |
| Organic matter, grains per gallon | | 2.60 |
| Total, " " | | 84.83 |

Sulphur Spring. Abequin, analyst.

*Alkaline-Sulphuretted.*

| | | |
|---|---|---|
| Sodium carbonate, | grains per gallon | 57.28 |
| Potassium bicarbonate, | " " | 11.28 |
| Magnesium bicarbonate, | " " | 1.64 |
| Calcium bicarbonate, | " " | 1.60 |
| Sodium sulphate, | " " | 1.93 |
| Magnesium sulphate, | " " | 1.52 |
| Magnesium chloride, | " " | 6.53 |
| Sodium silicate, | " " | 1.22 |
| Sodium iodide | | trace. |
| Organic matter, | grains per gallon | 3.62 |
| Total | " " | 85.62 |
| Sulphuretted hydrogen, cubic inches | | 97.10 |

Ferruginous Spring. Abequin, analyst.

*Chalybeate.*

| | | |
|---|---|---|
| Sodium carbonate, | grains per gallon | 0.355 |
| Iron bicarbonate, | " " | 9.640 |
| Potassium chloride, Sodium chloride, | " " | 1.170 |
| Magnesium chloride, | " " | 0.520 |
| Aluminium silicate, | " " | 3.320 |
| Organic matter, | " " | 0.818 |
| Total | " " | 15.823 |

Livingston Artesian Well.

*Saline.*

| | | | |
|---|---|---|---|
| Magnesium bicarbonate, | grains | per gallon | 2.320 |
| Calcium bicarbonate, | " | " | 7.140 |
| Iron bicarbonate, | " | " | 0.204 |
| Iron perchloride, | " | " | 0.190 |
| Potassium chloride, | " | " | 0.325 |
| Sodium chloride, | " | " | 295.435 |
| Magnesium chloride, | " | " | 1.839 |
| Calcium chloride, | " | " | 2.983 |
| Sodium bromide, | " | " | 0.980 |
| Silicates, | " | " | 1.138 |
| Strontia | | | trace. |
| Total grains per gallon | | | 312.554 |
| Gases: | | | |
| Carbonic acid, cubic inches | | | 21.47 |
| Carbonic acid in combination, cubic inches | | | 9.32 |

Blount Mineral Springs, near Bigbee, Washington County.

No. 1. Red Spring. R. Brumby, analyst.

*Saline-Sulphuretted.*

| | | | |
|---|---|---|---|
| Magnesium carbonate, | grains | per gallon | 4.40 |
| Calcium carbonate, | " | " | 6.80 |
| Iron carbonate, | " | " | 1.92 |
| Magnesium sulphate, | " | " | 1.60 |
| Sodium chloride, | " | " | 32.32 |
| Magnesium chloride, | " | " | 6.00 |
| Total | " | " | 53.04 |
| Gases: | | | |
| Carbonic acid, | cubic inches | | 6.00 |
| Sulphuretted hydrogen, | " | " | 14.96 |

No. 2. Red Spring. Henry Laffman, analyst.

*Saline.*

| | | | |
|---|---|---|---|
| Magnesium carbonate, | grains | per gallon | 3.67 |
| Calcium carbonate, | " | " | 7.23 |
| Sodium sulphate, | " | " | 0.89 |
| Calcium sulphate, | " | " | 0.28 |
| Sodium chloride, | " | " | 29.86 |
| Magnesium chloride, | " | " | 0.78 |
| Alumina, | " | " | 3.00 |
| Sulphur, | " | " | 2.07 |
| Iodides | | | trace. |
| Total grains per gallon | | | 47.78 |

No. 3. Sweet Spring. B. Brumby, analyst.

*Saline-Sulphuretted.*

| | | | |
|---|---|---|---|
| Magnesium carbonate, | grains per gallon | ..... | 3.60 |
| Calcium carbonate | " " | ..... | 4.48 |
| Iron carbonate, | " " | ..... | 1.12 |
| Magnesium sulphate, | " " | ..... | 2.40 |
| Sodium chloride, | " " | ..... | 30.88 |
| Total, | " " | ..... | 42.48 |

Gases:

| | | | |
|---|---|---|---|
| Carbonic acid, | cubic inches | ..... | 6.00 |
| Sulphuretted hydrogen, | " " | ..... | 12.56 |

No. 4. —— Spring. W. C. Stubbs, analyst.

*Sulphuretted-Saline.*

| | | | |
|---|---|---|---|
| Magnesium carbonate, | grains per gallon | ..... | 9.40 |
| Calcium carbonate, | " " | ..... | 5.72 |
| Barium carbonate, | " " | ..... | 0.91 |
| Calcium sulphate, | " " | ..... | 1.27 |
| Iron carbonate, | " " | ..... | 3.19 |
| Potassium chloride, | " " | ..... | 7.07 |
| Sodium chloride, | " " | ..... | 23.21 |
| Magnesium chloride, | " " | ..... | 2.04 |
| Magnesium iodide, | " " | ..... | 0.14 |
| Magnesium, bromide, | " " | ..... | 0.16 |
| Silica, | " " | ..... | 2.44 |
| Calcium phosphate, lithium, alumina | | ..... | traces. |
| Total grains per gallon | | ..... | 55.55 |

Gases:

| | | | |
|---|---|---|---|
| Carbonic acid, | cubic inches | ..... | 4.72 |
| Sulphuretted hydrogen, | " " | ..... | 30.67 |
| Oxygen and nitrogen, | " " | ..... | 7.08 |

Harrell Springs, near Blount Springs, Blount County. Summers, analyst.

*Chalybeate.*

| | | | |
|---|---|---|---|
| Iron carbonate, | grains per gallon | ..... | 6.00 |
| Magnesium sulphate, | " " | ..... | 1.00 |
| Calcium sulphate, | " " | ..... | 3.00 |
| Magnesium phosphate | " " | ..... | 0.50 |
| Lithium, organic matter | | ..... | traces. |
| Total grains per gallon | | ..... | 10.50 |

Taladega Spring, near Fayetteville, Taladega County. W. C. Stubbs, analyst.

*Sulphuretted.*

| | | | |
|---|---|---|---|
| Sodium carbonate, | grains | per gallon | 12.32 |
| Potassium carbonate, | " | " | 7.99 |
| Magnesium carbonate, | " | " | 0.93 |
| Calcium carbonate, | " | " | 8.78 |
| Calcium sulphate, | " | " | 10.89 |
| Sodium chloride, | " | " | 5.34 |
| Alumina, | " | " | 1.45 |
| Silica, | " | " | 2.45 |
| Iron carbonate | | | trace. |
| Total grains per gallon | | | 50.15 |
| Sulphuretted hydrogen, cubic inches | | | .82 |

Roper Mineral Wells, Greenville, Butler County. W. C. Stubbs, analyst.

*Calcareous Chalybeate.*

| | | | |
|---|---|---|---|
| Soda, | grains | per gallon | 1.55 |
| Potash, | " | " | 8.55 |
| Magnesia, | " | " | 17.61 |
| Lime, | " | " | 40.47 |
| Silica, | " | " | 10.32 |
| Ferrous oxide, | " | " | 56.72 |
| Ferric oxide, | " | " | 116.58 |
| Chlorine, | " | " | 2.39 |
| Carbonic anhydride, | " | " | 21.58 |
| Sulphuric oxide, | " | " | 315.85 |
| Total | " | " | 601.62 |

Johnson's Wells, near Meridianville, Madison County. W. C. Stubbs, analyst.

*Saline.*

| | | | |
|---|---|---|---|
| Soda, | grains | per gallon | 27.76 |
| Potash, | " | " | 1.55 |
| Magnesia, | " | " | 0.22 |
| Lime, | " | " | 18.91 |
| Aluminic oxide, | " | " | 12.41 |
| Silica, | " | " | 1.16 |
| Chlorine, | " | " | 44.24 |
| Organic matter, | " | " | 1.98 |
| Carbonic anhydride, | " | " | 10.50 |
| Sulphuric oxide, | " | " | 39.45 |
| Total | " | " | 158.18 |

Taylor's Springs, one mile from Florence, Lauderdale County.
J. Lawrence Smith, analyst.

Spring No. 1.

*Indifferent.*

| | | | |
|---|---|---|---|
| Sodium bicarbonate, | grains | per gallon | 0.42 |
| Magnesium bicarbonate, | " | " | 0.58 |
| Calcium bicarbonate, | " | " | 1.03 |
| Iron bicarbonate, | " | " | 0.26 |
| Sodium sulphate, | " | " | 0.03 |
| Magnesium sulphate, | " | " | 0.02 |
| Sodium chloride, | " | " | 0.12 |
| Magnesium chloride, | " | " | 0.12 |
| Calcium chloride, | " | " | 0.14 |
| Silica, | " | " | 0.29 |
| Organic matter, | " | " | 0.81 |
| Potassium chloride, alumina | | | traces. |
| Total grains per gallon | | | 3.82 |

Spring No. 2.

*Indifferent.*

| | | | |
|---|---|---|---|
| Sodium bicarbonate, | grains | per gallon | 0.49 |
| Magnesium bicarbonate, | " | " | 0.64 |
| Calcium bicarbonate, | " | " | 1.30 |
| Iron bicarbonate, | " | " | 0.23 |
| Sodium sulphate, | " | " | 0.03 |
| Magnesium sulphate, | " | " | 0.03 |
| Sodium chloride, | " | " | 0.08 |
| Magnesium chloride, | " | " | 0.06 |
| Calcium chloride, | " | " | 0.07 |
| Silica, | " | " | 0.32 |
| Organic matter, | " | " | 1.01 |
| Loss, | " | " | 0.04 |
| Potassium chloride, alumina | | | traces. |
| Total grains per gallon | | | 4.30 |

Spring No. 3.

*Indifferent.*

| | | | |
|---|---|---|---|
| Sodium bicarbonate, | grains | per gallon | 0.43 |
| Magnesium bicarbonate, | " | " | 0.55 |
| Calcium bicarbonate, | " | " | 1.09 |
| Iron bicarbonate, | " | " | 0.25 |
| Sodium sulphate, | " | " | 0.03 |
| Magnesium sulphate, | " | " | 0.03 |
| Sodium chloride, | " | " | 0.07 |
| Magnesium chloride, | " | " | 0.11 |
| Calcium chloride, | " | " | 0.07 |
| Silica, | " | " | 0.26 |
| Organic matter, | " | " | 1.54 |
| Potassium chloride, alumina | | | traces. |
| Total grains per gallon | | | 4.43 |

And the following with no published analysis.

*Chalybeate Springs:*

Bailey Springs, Lauderdale County.

Bowie Springs, near Talladega, Talladega County.

Chandler's Spring, Talladega County.

Cliff Springs, Saint Clair County.

Coffee Spring, chalybeate and sulphuretted, Geneva County.

Dr. Davis's Spring, Walker County.

Ellis Spring, Colbert County.

Green Springs, Hale County.

Jenkin's Springs, Clay County.

Lay Springs, chalybeate and sulphuretted, Etowah County.

Shacco Springs, chalybeate and sulphuretted, Talladega County.

Sullivan's Springs, Washington County.

Waterloo Mineral Spring, Lauderdale County.

West's Mineral Spring, Walker County.

White Sulphur Springs, chalybeate and sulphuretted, Calhoun County.

Windham Springs, chalybeate and sulphuretted, Tuscaloosa County.

Near Akron Junction, Hale County.

Near Claiborne, Monroe County.

Six miles southwest of Green Springs, Hale County.
Near Gum Spring, Blount County.
Six miles north of Jacksonville, Calhoun County.
Near Jasper, Walker County.
On Sand Mountain, Jackson County.

*Saline Springs:*

Blount Mineral Springs, saline and sulphuretted, Blount County.

Franklin Springs, saline-chalybeate, near Russellville, Franklin County.

Golden Springs, near Oxford, Calhoun County.
Lansford Spring, near Florence, Lauderdale County.
Stewart's Springs, near Florence, Lauderdale County.

*Sulphuretted Springs:*

Blue Grass Sulphur Springs, sulphuretted and chalybeate, Cornelia, Saint Clair County.

Cook's Springs, sulphuretted and chalybeate, 20 miles southwest of Ashville, 5 miles from Wolf Creek, Saint Clair County.

Howell's Spring, Lauderdale County.
Jackson Springs, Jackson, Clarke County.

Major Shever's Sulphur Springs, near Jasper, Walker County.

Moore's Springs, Maple Creek, near Athens, Limestone County.

Wooley's Springs, Limestone County.
Near Hatcher's, Clay County.
Near Hazel Green, Madison County.
Six miles south of State line, Limestone County.

*Sulphur Springs:*

One mile from Frankfort, Franklin County.
Near Bonner, Calhoun County.
Eleven miles from Ashville, Saint Clair County.
Four miles from Springville, Saint Clair County.
Seven miles east of Stevenson, Jackson County.
On Sulphur Creek, near Athens, Limestone County.
Sulphur Springs, De Kalb County.

*Uncharacterized Springs:*

Borden Springs, Cleburne County.
Burning Spring, Washington County.
Butler Springs, Butler County.

Carman's Spring, near Fayette Court House, Fayette County.

Healing Springs, 70 miles north of Mobile, Washington County.

Lee's Spring, near Florence, Lauderdale County.

Ligon's Springs, 5 miles from Russellville, Colbert County.

Newsom's Springs, miles south of Barton, Colbert County.

Pettusville Springs, Limestone County.

Shelby Springs, near Knight, Shelby County.

Speakses Springs, near Talladega, Talladega County.

Stephenson's Springs, near Camp Spring, Lawrence County.

Tallahatta Springs, Clarke County.

Tar Spring, 9 miles south of Oakville, Lawrence County.

At Broken Arrow, Saint Clair County, Matchless Mineral Spring, 3 miles east of Greenville, Butler County.

Near La Fayette, Chambers County.

Near Saint Stephens, Washington County.

Near Village Springs, Blount County.

Near Pisgah, Jackson County.

One mile from Coosada Station, Elmora County.

Very few, if indeed any, of the mineral waters of Alabama are used commercially, even of the analyzed waters. Bladen, Bailey, and Blount springs are of old repute, and the analyses of these and of several others exhibit chemical properties of decidedly therapeutical value. Several of the localities, particularly those in the northern section, are healthful, and scenery roundabout attractive, lacking enterprise only to make them popular resorts.

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PURIFYING WATER BY CHEMICAL ACTION.—According to Dr. Dupont, a Parisian physician, a safe and effective method of purifying water by chemical action has been discovered. In an article in the *Annales d'Hygiene Publique* the doctor says the methods heretofore used for purifying drinking water have been by filtration and by the action of heat. Filtration is the oldest and, as he claims, least effective method. Even filtration through porous porcelain, the most effective substance

known, cannot always be trusted, he insists, especially after the apparatus has been long in use. Dr. Dupont does not assert that boiling fails to destroy noxious germs, but he says that it often leaves in the water organic matter that might be dangerous to health, and that boiling makes water less digestible by robbing it of its gases. He instances a case in which water from the Seine was found after boiling to contain more microbes than before.

M. Girard, Director of the Municipal Laboratory of Paris, and Dr. Bordas, a pupil of Professor Brouardel, have recently presented to the Academy of Sciences, through the chemist Friedel, a communication on the purification of water by chemical action. The chemicals used are permanganate of lime and binoxide of manganese. The permanganate of lime coming in contact with organic matter and micro-organisms, destroys them and decomposes itself into oxygen, oxide of manganese and lime. Then, to carry off the surplus of permanganate and complete the purification, the water is poured over binoxide of manganese. Oxygen in the nascent stage is thus freed, and it burns up any remaining germs. There remain then in the apparatus inferior oxides of manganese, which hasten to reoxidize themselves and furnish again a certain quantity of binoxide of manganese. The water, as thus finally purified, contains a little lime in the form of a bicarbonate and traces of oxygenated water.

A very small quantity of permanganate of lime is used in this process. Not more than 1.3 grains Troy to about a quart of water taken from the Seine at a point near Paris resulted in the production of so-called pure water, as wholesome as spring water. Dr. Dupont says that if the process can be made successful on a large scale the question of purifying water is settled. Water containing 100,000 colonies of microbes per cubic centimetre can thus be purified, and ice placed in water with permanganate of lime is also quickly sterilized.

# INFANTILE LIFE INSURANCE IN EUROPE.

By C. W. CHANCELLOR, M.D.*

AS the question of infantile insurance is at the present time forcing itself upon the American public, and through it upon the legislatures of the several States, it may not be out of place to draw attention through a consular report to the system as it exists in some of the European countries, which will serve at least to indicate whether infant insurance in its present form is, on the ground of public policy, a good or bad thing.

It has been asserted, perhaps rashly, that the deaths of a large number of infants in England and France are due to their being insured, or, in other words, that children are deliberately murdered for insurance money.

In France, a bonus is paid by some municipalities to the mothers of illegitimate children to prevent, it is said, the clandestine destruction of such children, while the women are yet overshadowed by the primeval sorrow of their sex, and thus preserve the offspring as an ultimate source of strength and wealth to the body politic. But no restriction whatever seems to have been placed upon another and greater possible cause leading to the death of many infants—namely, that of gambling upon the survival of the child by insuring its life with the view to benefit in case of its death. No one can predict the consequences of such evils, which are already recognized in prudent quarters as fraught with great peril to public morals, and which naturally give rise to the opinion that civilization at the end of the nineteenth century is not particularly remarkable for skill, intelligence, or address in dealing with problems of social science.

That the insurance of infants may be a possible cause of their death, cannot any longer be doubted. If parents are negligent of their children under any circumstances, the fact

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* United States Consul at Havre France. Consular report to State Department, April 19th, 1895.

that they are insured would tend to act upon an evil mind as a direct inducement for further negligence; or, if an infant is inclined to be sickly, there is an inducement to allow "nature to take its course," which it generally does, if the child has been insured, in a very speedy manner.

In France, it appears that the companies allow policies to be effected by people who have no insurable interest, properly so called, in the life of the insured, and I am informed that no discrimination is made against illegitimate children. Indeed, the insurance may be effected by persons who have a direct interest in the death of the insured, such as of illegitimate children, the children of very poor people, or children who, from one cause or another, are a burden to those who have the care of them.

Had the philosopher of Aulus, who declaimed against the "unnatural behavior of wealthy mothers in neglecting to suckle their own children," lived at this time, when men and women of high social position choose their partners for life for the largeness of their fortunes or the glamour of titles, he would perhaps not be surprised at this "unnatural behavior;" or that people in less favored circumstances should at times show so little compassion to their offspring. We cannot suppose that there is less temptation to the latter class in regard to the lives of their children than in that of the wealthier classes; for if there is a temptation at all, surely common sense must allow that it is to that class of persons who are least able to support their children.

The mean chances between classes who differ widely in their circumstances, or the averages formed from the mortality which obtains in large classes, are inapplicable for the safe guidance of statisticians. The desideratum is to ascertain in what degree mortality is influenced by the circumstances under which various classes have been placed. M. Villermé, in order to collect satisfactory information of this kind, made a comparison of two districts in Paris—the first district, which contained the largest proportion of wealthy people, and the twelfth, which contained the greatest proportion of poor people. The total difference was such that when fifty died in the first district, one hundred died in the twelfth. There was one birth annually for every thirty-two inhabitants

of the first district, and one in twenty-six of the twelfth, and yet there were not more children under five years in the last than in the first—a proof that the poor bring forth more children than the rich, but preserve fewer. But the baneful effects of poverty is most perceptible in the greater mortality among the very young, showing that poverty, neglect, and bad diet, which tend to weaken the general constitution, should always be taken into account as a powerful predisposing cause of mortality among infants or children under five years of age. Statistics gathered by Dr. Granville show that of 876 marriages among the poorer classes there were 3942 births, or an average of 4½ to each marriage. Of these 1676 children, or less than one half, survived. Among the middle or the higher classes we should not probably have found so many as 3942 births, but a greater number than 1676 survivals.

As regards "sickly children," it is stated that they must undergo a medical examination, and that the companies will accept no risk not approved by the medical examiner; but, on the other hand, it is not improbable that the examination is often made in the most perfunctory manner, and it is said that children are sometimes insured whose lives are in a precarious state. The insurance is not infrequently effected by people who have charge of the child to nurse it for a weekly payment, but such insurances are not effected until there seems a reasonable chance of the child dying, or the payments are in arrears, so that on the death of the child the nurse will be able to recoup herself for the loss out of the insurance money. Again, the agents of the companies are paid by commissions, and though this may be the only practical mode of payment, commercially speaking, it offers a direct inducement for their taking insurances with very little injury.

It is not probable the work could be carried on without such canvassers. They go among the people and persuade them. They say to them, "You ought to be economical and thrifty; you ought to provide for your families," and in this way they set up a propaganda of extravagant thrift. This is shown when we compare the amounts spent in commissions and costs of managements with the amounts of premiums received by the companies during one year. The following table

shows the percentage during a prosperous year of several of the large English companies in which infants are insured :

| Name of Company. | Premiums Received. | Commissions and Management. | Percentage of Premiums Paid in Commissions. |
|---|---|---|---|
| Workman's Assurance | £153,384 | £74,317 | 48.4 |
| Pearl Life Assurance | 213,931 | 107.194 | 52.2 |
| Prudential Assurance | 2,911.295 | 1,126,158 | 38.7 |
| Refuge Assurance | 349,942 | 182,055 | 52 |
| Wesleyan Assurance | 119,701 | 65,219 | 54.5 |

These figures show that on the average 50 per cent of the premiums are spent in obtaining them, and of the money paid by the insured only one half is in any year available as assets, the rest going for the benefit of the management. It is estimated that out of over 3,000,000 members one half are children.

The reason that so many children who are insured do not die is not because insurance is a good thing, but because many parents do not argue the matter at all, but do their duty by their children to the best of their ability without reference to the insurance, which only costs them a few sous per week, but with the evil-disposed it is quite different—the insurance is a direct inducement to neglect and kill their children.

A frequent cause of death in children is what is called "exhaustion from malnutrition," and the method by which this is brought about is so simple that it is no wonder it often occurs. All the parents have to do is to stuff the child with improper food, and the more they give it the weaker it gets. It is impossible in such a case to determine absolutely if such feeding is done purposely or from ignorance ; but the impression formed from such cases seems very general that in the majority there is a great deal of method, for although these people may be uneducated, and ignorant of the simplest rules of dietetics and hygiene, they are quite cunning enough to know that such a course of treatment can be carried out with impunity. Another frequent cause of death among infants is "suffocation" while in bed with their parents. It is said that more than 30 per cent of "accidental deaths" are of children who die in this way, and although this is clearly a preventable

cause of death, which with a little care from the parents could be overcome, yet it has been found that a number of children so dying were insured, and the parents were enabled to take advantage of their own carelessness by receiving the insurance money.

The most important point, and the one to be first considered, is the question whether it is in accordance with public policy that infant insurance should be allowed at all. The strongest argument in favor of the practice is that it encourages thrift and induces parents to spend more money in the care of a child while alive than they would do if it was not insured. But where is the evidence of the thrift? The parent is putting by money for which he can get no return unless the child dies, and then the amount paid is wholly out of proportion to the amount invested, and the matter, commercially, assumes a gambling aspect, the stake in the game being the life of the child.

It is further urged in favor of infant insurance that the parent is more likely to provide extra food and delicacies for a child who is insured, as he knows that if it dies he will be able to reimburse himself somewhat by the insurance money. But surely this argument tends directly against the policy of the system, for it must be obvious to any thinking person that if an evil-minded parent argued upon the matter at all, he would argue in this manner: "My child's life is insured; if I spend extra money in medical advice and proper food, I may keep my child alive, and so I shall have no benefit from my insurance, and shall have spent my money in premiums to no advantage; but if I neglect to get proper food and advice the child will die, and I shall have saved my money and be in pocket from the insurance."

It is also urged by the friends of the practice that but few cases can be pointed to in which a question of insurance has been proved to be an inducement to murder or neglect. This bare statement is no doubt correct, but that is on account of the extreme difficulty of bringing the matter home to the guilty. In the English courts it has been decided that "it is not sufficient to convict a person for manslaughter by neglect unless the medical man is enabled to state positively that the child's life might have been prolonged by medical aid and

other necessaries." In such cases, it is impossible to expect a medical man to swear to that which is only at the best a matter of opinion.

With all these difficulties in the way of bringing home to persons the consequences of their neglect or crime, it surely is worthy of the grave consideration of our legislatures whether a system which must hold out an extra inducement to parental neglect and crime should not be prohibited altogether, or at least placed under the most stringent control.

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DEATH-RATE AMONG INSURED CHILDREN.—The favorite argument of opponents of child insurance is, says the *Indicator*, that it leads to child murder, and if their statements were to be believed, there has been a heavy increase in mortality among children as a consequence of infantile insurance. They have, however, not only not been able to produce any reliable statistics in proof of this, but such statistics as have been available have all been against their theory. It has been shown in England, for example, that the death-rate among the insured has been lower than among the uninsured, and some statistics recently collected by Frederick L. Hoffman, of New York, showing the death-rate among children in the large cities of the United States, proves that the mortality among insured children is below the general rate. Mr. Hoffman is a statistical expert, and his figures can, therefore, be relied on. Here are his figures:

| Ages. | Insured. | Total Deaths. |
|---|---|---|
| Between 1 and 2 | 61.55 | 62.78 |
| Between 2 and 3 | 30.35 | 35.38 |
| Between 3 and 4 | 20.35 | 23.62 |
| Between 4 and 5 | 15.23 | 17.47 |
| Between 5 and 6 | 11.85 | 11.20 |
| Between 6 and 7 | 9.04 | 9.78 |
| Between 7 and 8 | 6.92 | 8.99 |
| Between 8 and 9 | 6.10 | 8.16 |
| Between 9 and 10 | 5.40 | 7.39 |

# THE RELATION OF NAVAL ARCHITECTURE TO PROPER SANITATION.

By J. R. TYRON, Surgeon-General, United States Navy.

THE problem of how to navigate the water was one of the first that appealed to the avarice, greed, spirit of adventure, and love of conquest resident in man. Formed by nature to be in touch with the soil, he found himself restricted to a territory intersected by many water-courses and limited by great seas and greater oceans. The world of history was then relatively small. Its story, beginning with the waters of the Euphrates, and moving rapidly over many years, soon centres on the shores of the Mediterranean, where those races lived that dominated for centuries all the known earth. Placed under smiling skies, with coasts washed by smooth waters for days together, and with islands on every side to shorten voyages and give shelter in time of storm, they found the great sea a constant appeal to extend their knowledge and dominion. To minds tending to all forms of superstition, the great unknown waters presented many terrors and seemed some great monster or god perpetually swallowing rivers and at times lashing itself into a rage of discontent. But familiarity lessens fear and intelligent experimentation gives self-confidence. Time and effort produced the much desired results, and from the raft and canoe of inland waters, ships were gradually evolved, commerce was born, and the conquest of distant lands became the passion of the time. Thus, early in the history of our planet, the human race created a pursuit that involved a separation of man and mother earth, and thus committed him to an artificial environment from which he was too often to suffer disease and early death.

Experience had to teach many lessons in relation to the nature of the medium through which and on which ships move. There was no theory of naval architecture; no application of mathematics to the complex problems involved. The outcome simply rested upon the great essential in all construction, that the result shall be adapted to the requirements. It there-

fore soon became apparent that the first essential in a ship is that she should be navigable with precision, speed, and comparative safety. A vessel having the same length as breadth, and thus opposing the same form and area to side progress as to forward progress, could never be navigated with precision whatever the propulsion. Even the earliest experiences with the raft and canoe had demonstrated the necessity for a form having much greater length than breadth. The effect of shape upon resistance in relation to speed also evolved at a very remote period the pointed or wedge-shaped prow and a limited variety of water line. While weight necessitated a degree of immersion, safety and carrying capacity determined the relation of draft, height of superstructure, and breadth. Such fundamental considerations have operated from the earliest ages and have perpetuated the general resemblance of all ships in all times.

While it is not necessary to bring forward all the essential reasons for the form of a ship, it is desirable to realize that, from the very nature of the work to be performed, seagoing vessels are limited to a certain shape without regard to any consideration of sanitation, and that it is this form, designed for all conditions of wind and weather, all climates and all seas, that has had much to do with the diseases of sea-faring people. This huge hollow spindle-shaped body, half immersed horizontally in water, divided by horizontal and vertical partitions, with few openings connecting its spaces with the outside atmosphere and crowded with stores, implements of war and men, has its general design fixed by unalterable conditions, and represents simply the structure required by the laws of nature to bring all races together and thus work out man's ultimate destiny on this globe. A human being placed within a floating body of this shape finds himself confronted with an existence for which he was not designed. His natural relation being therefore disturbed, there ensues a greater or less struggle in the effort to adjust himself to his surroundings. In the end there is necessarily a certain degree of individual loss which varies with the power of adaptation. This power depends to a great extent upon knowledge and intelligence, through which he can alter his surroundings, approximating them more or less to nature, of which he is a part.

The study of the preservation of life from actual violence and of the destruction of life has always occupied the minds of the human race, but the subtle conditions under which health is maintained and life preserved have not from their very nature appealed so strongly to man's sense of self-interest. Those whose lives have been given up to the scientific study of the former consideration have been regarded as men of affairs, leaders of races, and makers of history, while those who have devoted themselves to the latter have found themselves away from the main thought of their age, and consequently more or less deprived of power to utilize that knowledge, second to none in value to mankind. This has been illustrated very strikingly in the history of the sea. Up to a very recent date no ship had ever been constructed in which the question of the health of the crew had been scientifically considered in the design itself, and there have been few after construction in which intelligent effort has been directed to the preservation of health. The great idea in all time has been to sweep the sea—to have dominion over the waters. For this purpose ships have been built as mere engines of war, and with but little consideration for the fact that the most indispensable mechanical instruments are men themselves. Ships were few, and represented much time and money; men were many, and could be easily replaced. And thus for hundreds of years much more anxiety was exhibited in preserving arms from rusting and cordage from rotting than in considerations affecting the health of crews.

The story of shipbuilding, so far as it is related with any definiteness, begins, as has been said, among the people of the Mediterranean. The Phœnicians desired to navigate the sea for commerce, and later the Greeks and Romans for trade and conquest, for supremacy as nations. They studied the problem in their own way, having due regard for the fundamental considerations heretofore presented. On smooth waters where a vessel with sails might be becalmed for many days together, necessity determined that the principal instruments of navigation for vessels of war should be oars. Oars would allow rapidity of motion and enable the attack on the enemy to be swift, sure, and complete. Naval architecture centred around the arrangement of oars, and every possible

expedient was resorted to to give each ship the greatest possible number. As there was one man to each oar, and as every additional biceps meant increased power, all available space was occupied, so that when a ship was in motion there was not room between decks for another human being. This necessity for crowding vessels of war with men has existed in all ages, and has been one of the greatest factors in determining the prevalence and intensity of disease. At first it was to get the maximum propulsive power, afterward it was to work guns and manage sails, and now it is to shovel coal and grind out shot, the purpose always being to have a greater force than the adversary at that supreme moment which is the summit of opportunity in a fighting ship. In that day the problem was simply to find the smallest space in which a man with an oar could work and then shape the ship for the maximum speed and efficiency. In those early days there was no upper deck, and consequently the supply of fresh air was unlimited, though the exposure to sun and spray was great. But as naval warfare became more complicated and its requirements better known, an upper deck became necessary to strengthen the ship for the use of the ram bow, to furnish a commanding position for the fighting men, and to give some protection to the rowers. But this deck, even when Rome was at the height of her power, was never complete. Gangways extended from the bulwarks toward the mid line, leaving a wide open space surmounted by a hurricane deck, between the supports of which an awning could be placed for protection against the weather. Below the rowers was the deck covering the hold containing cisterns of drinking water, and much bilge water. All these vessels were built of timber never allowed to season before being used in construction, that it might be bent into the necessary shapes. As a result the seams were continually opening and, in spite of calking and application of tar, the mass of bilge water required the constant use of buckets in bailing or of a machine consisting of an Archimedean screw worked by some sort of treadmill.

In the typical warship of ancient times there were placed 174 men, arranged in three tiers, in a rowing space of about 15,000 cubic feet. Below them was the hold, with its constantly renewed bilge water, and above was the sky, which

could be seen by those rowers in the upper bank. Then there was the mast with the square yard and sail, and on each side the many oar ports, closed against the water by leathern bags. Such were the war vessels of the ancients, and in all essentials of the whole world until the fourteenth century, when the application of magnetic attraction in a practical form to purposes of navigation inspired mariners with confidence and made it possible for them to commit themselves to the trackless ocean without fear. These ancient war vessels, constituting the navies of the world, show from their very construction and from the scope of their work that they were not the homes of such diseases as have made the account of many cruises of more recent times one of suffering and death. They were calculated only for a tranquil sea, and seldom ventured far from shore or quitted ports at those seasons when hurricanes or tempestuous weather were liable to endanger their safety. Fitted with flat keels and constructed with rather flat bottoms, they were frequently drawn up on shore, and were at no time the permanent homes of men. With enemies near at hand, naval fights were soon precipitated, and after victory the conveyance of troops was alone necessary for the complete subjugation of the most powerful and remote territories. Indeed, for purposes of war, the soldier and the sailor were often the same, as shown in the invasion by William the Conqueror, whose ships were burned as soon as he landed on the English coast. But the mariner's compass and the introduction of cannon on board ship made a wonderful change. Then the nations of Western Europe filled the Mediterranean with sailing-vessels devised for voyages on the ocean, and oars finally gave place to sails, though, as a rule, still holding their own on vessels designed solely for use in that landlocked sea. With the mariner's compass and the introduction of cannon begins the story of sea voyages of discovery and the history of the long struggle with diseases at sea. Prior to that time naval architecture reached the limits of perfection in a few years, so that States that had neglected maritime pursuits were able on the impulse of the moment to place themselves on an equality with the strongest sea powers. But gunpowder and the magnetic needle, when the knowledge of them became common, augmented in a wonderful manner the prop-

erties of ships, whether for war or for commerce, changed their construction in a great degree, and made them the permanent homes of men. From that time the scene of maritime greatness shifts gradually from the smiling Mediterranean to the tempestuous Atlantic, and naval architecture moves from vessels with oars to ships with sails. The galleon superseded the galley, and the day of ancient ships was passed. Madeira, Cape of Good Hope, America, and the route to the Indies are names marking this new era in the history of the sea. Shortly after these discoveries the introduction of cannon on shipboard became general, and it was in 1500 that Descharge invented portholes.

The navigation of the Atlantic and the use of cannon, with the introduction of portholes, led to ships of greater size, higher sides, and many decks. Decks, on the abolition of oars, ceased to be open along the mid-line, communication being maintained by square hatches, which were closed in bad weather. The questions of naval architecture now centred on the greatest amount of sail and number of guns. Toward the close of the sixeenth century Spain had vessels of three decks carrying over 100 guns, and that country was followed, in the seventeenth century, by England, who eventually built ships carrying 120 guns and 800 men.

The era of sailing ships of war begins, then, in the fourteenth century. It continues for nearly five hundred years, and its story has many chapters of suffering and death incident in great part to a faulty construction of the vessels themselves. These old ships were built of wood and had holds of great depth, that they might sail close to the wind. Guns were placed even on the lowest deck, and for many years the portholes on that deck were within 16 inches of the water. Communication between decks was maintained by hatches, those leading to the hold being closed except when it was necessary to break out stores. The lowest part of the ship was therefore a perfectly dark and unventilated space, and as the bottoms of vessels of war were not coppered until after 1779, was never free from a considerable amount of water. For many years the air in this part of ships would at times be so foul as to stifle men before they could be drawn up; and next to drowning, the most common accident peculiar to a

life at sea was suffocation from foul air. The necessity for visiting the hold was not infrequent, for the pumps were subject to be clogged with filth, and some one had to venture down in the well to clear them. Besides, until 1815 all drinking water was carried in casks and each day a sufficient number of these had to be hoisted for that day's supply. At sea this was frequently the hardest and most dangerous duty of seamen. Next to the violent pressure on the abdomen while lying on yards in furling sails, it was believed to be the most potent factor in the production of hernia. It also was the cause of many other injuries, and exposed the man each day to poisonous and at times irrespirable air. In the hold, until this century, was also carried gravel, sand, or other earthy substance for ballast. This retained putrescent matters and was a prolific source of disagreeable odors and disease. In a correspondingly short time the lack of ventilation and the presence of decomposing material and moisture caused more or less decay in the various stores and even in the timbers of the ship. This condition of things existed on every vessel of war, and was a marked local cause of discomfort and disease. The utmost distress would at times arise from the decay of water casks on long voyages and in remote parts of the world, where they could not be replaced, while drinking water carried in imperfect casks and exposed for months to vitiated air would generate and absorb various poisons and cause many deaths.

The ships of this period were in a general way much like those of later times. Decks communicated by hatches and contained tiers of ports for guns. To work the guns with which each vessel was burdened, men in great numbers had to be provided, so that the living spaces were very much crowded. Ports were closed in bad weather for days together, the lower tier being rarely open under any circumstances. As there was at such times no arrangement for the admission of light, the darkness between decks necessitated the use of candles, which further vitiated the atmosphere. Hatches were frequently not placed in line, one below another, so that the lower decks were often deprived to a great extent of the slow vertical exchanges of air from difference of temperature. Openings on the upper or spar deck were covered in time of

storm, thus shutting off all communication with the outside air. When it is added to this that in the largest navy of the world the supply of soap and fresh water was very limited until 1810 or 1815, and that but few changes of clothing were provided, there is presented a picture of a dwelling place the details of which can be safely left to the imagination. Under such circumstances it can be readily perceived that the great dangers of a seafaring life were resident in the ship itself, and that these would increase with the size of the vessel, the multiplicity of decks, and the number of the crew. The larger the ship the greater the amount of sickness and death This is well illustrated in the expedition of Hosier to the West Indies in 1726. His fleet consisted of seven ships of the line. It is stated that before his return he buried two crews for each vessel, the causes of death being scurvy, fever, and intestinal troubles. Though this is perhaps the most disastrous instance of the baneful effects of sickness in any navy, history supplies us with many others in which naval expeditions have been entirely frustrated by the force of disease alone. Among these may be enumerated that of Mansfeldt in 1624, the Duke of Buckingham in 1625, Wheeler in 1693, the expedition to Carthagena in 1741, D'Anville in 1746, and the French expedition to Louisburg in 1757. But prior to all these may be mentioned the invasion of France by Henry V. in the early part of the fifteenth century, in which, owing to some delay in the embarkation, his army was reduced by dysentery from 50,000 to 10,000. Nor is the story of Anson to be forgotten, who in a cruise of a little more than three years buried four fifths of his crew and had lost 200 men within five months after his departure from home. It was on this expedition that the captains and surgeons of the squadron represented to the commodore the frightful condition of the air between decks, and the absolute necessity for some change, that the men might be allowed to breathe and that the ships, which were so deep in the water that their lower ports could not possibly be opened, might be relieved to some extent of the stench, increased by the large number of sick. As a result, six air scuttles were cut in each ship in such places as the strength of the structure would allow.

Sir Richard Hawkins, who lived early in the seventeenth

century, mentions that in twenty years he himself had known of 10,000 deaths from scurvy alone, and it is stated that in 1739 the vessels in the squadron at anchor at Spithead stunk to such a degree that they infected one another, and that the men became so dangerously ill from want of air that they were put ashore to recover their health. The English Channel fleet in 1780 was so overrun with scurvy and fever that it was unable to keep the sea after a cruise of only ten weeks. During this year there were transferred from the fleet to one naval hospital over 5000 cases of continued fever and nearly 1500 cases of scurvy. In the same year in the British West Indian fleet, having a strength of 12,109 men, the mortality was 1518 from disease alone, and but few of these deaths were due to yellow-fever. It was in this same century that the Spanish ship *Oriflamma*, on her passage from Manila to Acapulco, a voyage in those days of nearly six months, was found at sea with her whole crew dead on board.

Now, while it is not intended in this partial enumeration to convey the idea that all this sickness and death at sea were due entirely to a faulty construction of the ships themselves, it is very evident that much of it was due to that cause alone, and that nearly all of it was to some extent inseparably connected with it. During all this period, up to the beginning of the present century, the great diseases of the sea were fevers, scurvy, dysentery, and diarrhœa. While scurvy, on account of its great prevalence, its disgusting characteristics, and its practical abolition from the sea in 1796, has in connection with its great mortality and its association with some of the most remarkable expeditions in history attracted the eye of the whole world, typhus-fever has been a more grievous and general cause of sickness and death. No one denies that the latter finds its cause in air contaminated by foul exhalations, derived in great part from the living human body, and incident to that crowding of human beings in filthy and contracted spaces. If citric acid be regarded as a preventive of the one disease, soap properly employed may be considered as almost of equal force in the other—the one remedy dating its general use from about 1796, and the other not making its influence felt in the navies of the world until some years later. But the degree of cleanliness, dryness, and ventilation on

board ship has had a direct relation to both diseases, and during their prevalence it was a subject of common observation how much more sickly than others some ships were in the same squadron, though supplied with the same diet. While every one admits that scurvy is a disease depending fundamentally upon the absence of certain salts in the food, there is no question that its prevalence and intensity bore a marked relation to confinement in bad air, indolent habits, and depression in spirits, and though not strictly a disease of the sea found something in the conditions of ship life outside of the question of food conducive to its propagation. As an example of this, it is stated that as Portchester Castle could not accommodate the French prisoners in 1798 a number were removed to a ship in an adjoining creek, where many exhibited scurvy, though the diet was the same on the ship as on shore, and at the latter place the disease did not appear. Time and again this trouble has occurred on ships when men in garrison have remained free from it, though living on the same diet. In all these instances lack of dryness, cleanliness, and ventilation, and also lack of exercise and recreation, have been a sufficient exciting cause.

The magnetic needle made long continuous voyages at sea possible. It incited man to build huge wooden structures that could withstand the assaults of the ocean itself, and bearing cutlasses and guns could sweep the sea and carry fire and sword into distant lands. For a navy consists of all the ships of war belonging to a nation, together with their officers, men, and equipment. It is that part of the fighting force of a country which operates on the water, guarding its coasts and protecting its foreign interests. It consists fundamentally of a number of movable floating forts of limited size and shape with a propulsive power resident in themselves. Of all probably the most indispensable mechanical instruments are men. And yet for hundreds of years but little thought was given to their care and preservation. Many experiments were made looking to the prolongation of the life of timber, but in regard to that of men the state was either careless and indifferent or too ignorant and economical to seek knowledge. When at last changes in naval architecture did occur they were based primarily upon the preservation of ships and stores. In all

attempts to introduce inventions designed solely for the improvement of health there was generally a more or less obstinate resistance, due to some extent to a superstitious attachment to long established practices and a greater or less contempt for all kinds of innovations.

It is true that necessity from almost the beginning of sea-going sailing-vessels has caused the introduction of wind-sails, which distributed air when it was least needed to only certain parts of the ship, never reaching the hold, and which were apt to be neglected on account of the difficulty in getting them up and care in trimming. Besides, the wind-sail could only be employed in mild weather, and was not always of use then, for near the equator, where fresh air was most needed, there would be many days of complete calm. There were times, too, when for days the atmosphere between decks had been stifling, that wind-sails would carry down to sleeping and probably sick men drafts of cold air, well calculated to add troubles to those already existing. It was not, however, until the eighteenth century that the air we breathe began to be intelligently investigated, and ventilation came to be seriously considered. We hear, in 1734, of Desagulier's machine for promoting ventilation by aspiration and propulsion, and at about the same time of Hales's ventilating apparatus, which consisted of the employment of wooden bellows worked by hand, and of Sutton's method of aspiration by heat, in which the supply of air for the galley fire was taken from the hold, to which fresh air was supplied by tubes leading from the upper deck. In all these methods the arrangements were either cumbersome and crude or considered open to other objection; and none of them was generally employed.

Though the need of ventilation between decks was recognized throughout the navies of the world by those having charge of men, to naval architects the evils arising from the presence of bilge water and foul air in the holds of ships were chiefly connected with the durability of material. It was found that the moisture and lack of ventilation tended to the formation of mould and the production of certain combinations destructive to the frames and planking below the water-line. In the attempt to obviate this the different ventilating appliances were now employed to a greater or less extent, the

Hales apparatus receiving more general attention than the others. This invention was first tried in 1753, and remained in use for nearly half a century. In addition to increasing the durability of the ships it promoted the health of the crews in a marked degree. The Earl of Halifax, comparing the mortality in the ships on the coast of Nova Scotia, stated that the deaths in ships which were not ventilated were in comparison to those that were ventilated as 12 to 1. The apparatus was not, however, kept in constant operation, and, moreover, was liable to get out of order on account of a lack of simplicity in structure. The admirable invention of Sutton, which was tried on a number of ships with very good results, failed in general adoption because of the inertia of those in power and the expressed reason of fear of fire on shipboard it strangely induced. Nevertheless, these inventions emphasized the good effects of fresh air upon the health of crews, and ultimately stimulated to some extent the introduction of air tubes and automatic ventilators. But about this time the system of shipbuilding, which had for so many years been obviously defective, began to be improved. As ships were not strong enough to bear the strains to which they were subjected without departure from their original lines and without in a relatively short time admitting an undesirable amount of water, inventive minds had long been seeking some marked improvement in construction. This found expression in 1806, when Sir Robert Seppings undertook among other marked changes to fill in the spaces between the frames under the flooring of the hold with pieces of wood, calked and pitched, leaving the higher spaces between the frames in communication, through the inner and outer planking of the ship, with the open air. These changes in construction, though undertaken to add strength and durability, are most important when considered in relation to proper sanitation. The cavities under the floor of the hold had long been the receptacles of every variety of filth and vermin. They had been responsible for hundreds of years for much of the foul air and offensive exhalations. Their obliteration and the creation of channels to the open air were allowed to supersede all other methods of ventilating the hold and did inaugurate an improvement in health at sea that cannot be overestimated.

This change, with the use of copper covering for the bottoms of ships, made a marked alteration in the condition of the hold, improving the air to such an extent that it ceased to be a cause of death by asphyxia.

Shortly after this a new method of ballasting vessels was introduced. The weight of iron tanks, each containing 2 tons of drinking water, was substituted for the sand and gravel usually carried, and which would remain undisturbed for years. Though the tanks also replaced the lower tier of casks the economy in storage was so great that the daily issue of water became more liberal, and therefore personal cleanliness more possible. Another result of this important change was that injuries at sea became less frequent, for water for daily use could now be supplied by force pump and hose, the necessity for hoisting casks no longer existing. The improvement in the storage of drinking water and the other changes indicated caused a marked diminution in the prevalence of continued fevers and lessened in a great degree the mortality formerly incident to naval life. It was also about this time that glass bull's-eyes were inserted into decks and ports for the admission of light in bad weather. This diminished the use of candles in the daytime and lessened to that extent the vitiation of air and the consumption of oxygen.

With all these changes may be mentioned one that was far from being unimportant. Formerly the place appropriated for the sick in a ship of the line was forward on the lowest gun deck. Undoubtedly such a situation for many years on account of the dampness, lack of air, and general inconvenience was in itself the cause of many deaths, but not long after the beginning of this century the sick bay was located on the deck above, where, with better air and easy access to the head for necessary purposes, a great improvement in results was quickly noticeable.

It is worthy of remark that the subject of sanitation on shipboard seems then at last to have occupied to some extent the minds of those in authority over the naval affairs of the world. The severe lessons of so many centuries of disease and death were at last producing effect. In this connection it may be mentioned that it was on January 23d, 1805, that surgeons in the English navy were given the same rank and

pay as their brethren in the army, and that thereafter the general character and professional skill of medical officers in that service became much improved. Men who had been allowed to enter the navy were required to mend their medical education or be expelled, and candidates for examination were possessed of more extensive information, as the rank and respectability which had been assigned the corps attracted good material. In the year following this change the public instructions issued to naval commanders in the British service contained for the first time directions relating to ventilation and cleanliness. Stricter discipline in matters relating to health, improvements in the medical service, and those changes indicated in naval architecture promoting dryness, ventilation, and cleanliness on naval vessels caused a rapid decrease in sickness. Two ships now were more than equivalent to three formerly in point of efficient service. Naval hospitals were no longer crowded to their full capacity, for scurvy had disappeared from the sea, and ulcers and febrile disorders had become less frequent and violent. In the English service this decrease was very striking, and throughout the world the story of the sea had ceased to be one continuous chapter of sickness and death. Much, however, still remained to stimulate effort and demand improvement. Continued fevers, intestinal disorders, rheumatic troubles, and particularly pulmonary complaints were still too common, and preventive medicine had still many problems to unravel, some of which, however, remain to this day unsolved. Every ship sailing the ocean soon contained many rotten timbers, all attempts at ventilation had only met with partial success, and men still slept crowded together in small spaces, as they do now, and as they probably will do for all time at sea.

It was in 1823 that the prevalence of pulmonary and rheumatic troubles and the too common appearance of malarial disorders and adynamic conditions, especially in the Tropics, called marked attention to the too frequent use of water on the decks of ships. It was the routine, and remained so until a very recent date, for men to begin scrubbing and holystoning decks at about 5 o'clock in the morning, and, with a short interval for breakfast, to continue that occupation for about five hours each day. Seamen were compelled to work with

bare feet in tons of water on the spar deck for over two hours each morning, even when the thermometer was below the freezing-point, and then were allowed to go to breakfast in wet clothes. After breakfast the lower decks were deluged with water and holystoned for an hour or more. Between decks the outlet for this water was into the hold by two small scuttle holes cut close to the ship's side. Through these openings there passed each day this mass of water, sand, vegetable and animal matters between the ship's side and lining. It was a common sight in those days to find men after all this exertion sitting around on wet chests or, after a night's debauch in that time of grog, sleeping in wet canvas clothes on the deck they had just scrubbed. The construction of a ship is such that with this treatment decks can never dry, and in spite of the so-called "drying stoves" then in use, they remained wet until again subjected to the water treatment. In this routine again becomes apparent the tendency in all times to subordinate health to appearances. The rivalry between commanding officers to have the best-looking ship was the mainspring of this action. While the decks were kept white as snow, water and filth were run into the hold, where it was generally allowed to remain, its removal presenting no external mark of approbation until the increasing sick list or odor demanded its removal. Not only was the dampness between decks exceedingly dangerous to health, but the accumulation of filth in the hold hastened the decay of timbers, and especially in the Tropics, where the putrefactive process runs its course most rapidly, made each ship a ready home for various infectious diseases. It has been well authenticated that if two ships shall happen to be cruising together, the one having the greatest amount of water between decks will have the largest sick list. This was especially noticeable in the days of scurvy, but is also true, it seems, for all times.

It was at this time that the Perkins ventilator received its most extended trial. The Hales ventilators had gradually succumbed to the common wind sail, as they were thought to occupy too much space and demand too much time and manual labor to work them. The Perkins ventilator was somewhat similar in action to the Thiers automatic pump, more recently in use, and consisted of two connecting tanks half

filled with water placed diagonally across the keelson and connected by valved tubes with the air of the hold and that outside. As a ship would pitch or roll the water would fall in one and rise in the other, and thus air would be taken into one by aspiration and forced out of the other by compression. This automatic arrangement appealed very strongly to the scientific minds of the service, and was of no small use. At any rate this ventilator and the wind sail were the best ventilating appliances in use on ships at sea in 1823. They were both of little force in the long days of calms in the Tropics, and were generally deficient in continuousness and certainty of action.

The hold has always been and must ever continue to be that part of a ship requiring continued care and attention. Being the lowest portion of a vessel, it must ever be there that gravity will carry much refuse animal and vegetable material. It is also that part of a ship which is ordinarily in the dark, and where dirt and filth remain out of sight and for the most part out of mind. It has presented the most difficult sanitary problems on shipboard, and has been the greatest cause of infection and death. In spite of its position and history probably no wooden vessel has ever been built in which the most perfect ventilation possible has been sought in the very construction of the ship itself. Ordinarily a vessel has been built first, and then some method of ventilating the hold devised afterward; or when any such system has been considered in the design, it has been poorly carried out or allowed to be defeated by simple mechanical difficulties. Naval architects during all the days of wooden ships thought for the most part of the vessels themselves, and but little, it would seem, of their crews, except in a general way. They were not medical men, and very naturally followed the lines of their own profession. It was seldom that medical minds were brought to work with them, and therefore changes in structure for sanitation were caused very slowly by a general diffusion of knowledge on such subjects.

All wooden ships had an outside and inside planking fastened to the frames, which were in turn fastened to the keel. The keel would then correspond to the vertebral column, the frames to the ribs, and the planking to the intercostals. The

spaces between the frames communicated below with the timbers or covered drainage channels on each side of the keelson, and it was here that the foul air would naturally leave the hold and find its way up between the outside and inside skin of the ship to the outer air. These natural uptakes were uninterrupted by the decks, which rested below on the shelf running horizontally the whole length of the ship and had the waterways above. Any opening through the waterways or shelf into any space between the outer and inner planking would, therefore, connect the decks with the hold. Unfortunately this was not infrequently done under the idea that the heated air between decks would pass up along with that from the hold into the outer air. But the motion of the ship at sea would often pump the air from the hold among the crowd of sleeping men. Besides the natural uptakes for the air in the hold were made nearly useless by obstructions formed by sills of gun ports and by blocks put in between frames to give stability to ringbolts used in working the guns. The sill of each gun port rested on the ends of two frames and thus completely occluded three channels, and as the ports of the upper tier were never directly above the lower, but between the port sills in large ships, obstructed the majority of all the communications of the hold with the outer air. Each chock let in for the ringbolts obstructed still another channel, and so a number of *cul-de-sacs* were formed where decayed wood, mould, and accumulation of filth made it easy for the ship herself to become diseased and almost impossible to disinfect her and free her from the plague. This condition of things in a greater or less degree obtained in all wooden ships, whether in the days of sail or steam.

Steam began to be used on naval vessels as a propulsive power about 1822. With it begins a new era in naval architecture and a most wonderful change in the life of the mariner. However, until a very recent date this power was employed as only auxiliary to that of sails. This was due at first to an incomplete knowledge of the capabilities of the newly discovered force and to the lack of sufficient ability to construct boilers and machinery suitable for its manifestation. Afterward, as the knowledge of steam engineering increased, sails were retained on account of the tendency of all ages to cling

to old ways and customs, and to resent the triumph of the new over the old. Machinery, boilers, and coal were put into sailing ships to be carried for the most part as so much cargo or ballast. Sail power remained unreduced and the battery practically unchanged. As a result the crowding on board ship was considerably increased. Not only was the extent of the living space much reduced, but the number of people greatly multiplied by the necessary stokers, firemen, machinists, and engineers. The capacity for carrying stores was, however, also diminished, and the number of days consumed in voyages much reduced. The mariner's compass had pointed the way across trackless oceans for four long centuries, and man had slowly and painfully followed, the sport and plaything of every wind and storm. Steam brought with it both speed and precision, gave motion even to the long days of calm, and shortened in a wonderful manner the unnatural separation of man from the soil. Ports were thus visited more often, fresh food became more common, and recreation and exercise not incident to life at sea more frequent. However, with the greater crowding of human beings in ships no additional means were provided for an increased supply of fresh air between decks. Machinery, boilers, and coal bunkers also rendered the hold more difficult of access for cleaning, and added oil, grease, cotton waste, and other filth to its contents. Concealed and filthy places in the lowest parts of ships became more common, the odor of bilge water more general, and the contamination of sleeping quarters more pronounced.

In the days of sailing-vessels work was for the most part performed on deck in the open air, but now a considerable portion of the crew was destined to work in the engine-rooms and fire-rooms in comparative darkness below the water-line, exposed for hours to temperatures at times exceeding 160° F. This change in the life of seafaring people has brought with it its own problems, and presents to-day one of the most serious questions in ship sanitation. No life could be more unnatural than that of the coal heaver and fireman on a ship. Working laboriously in confined spaces, subjected to great heat, and breathing an atmosphere containing quantities of coal dirt and other impurities, many of them suffer from sudden exhaustion, organic heart trouble, or a premature diminu-

tion of vital powers. As the use of steam has increased, and engines of higher and higher power have been devised, this class of men in a ship's complement has increased, and this subject has assumed greater and greater importance and become more and more worthy of a consideration it has never received.

When steam was first applied to vessels of war the energy was exerted upon the water by paddle wheels. At that time the engine-room hatch was naturally in communication with the berth deck, from which a considerable quantity of foul air was drawn by the current ascending from the fire-room. When the propeller came into use, though a slight saving of space resulted, it was considered necessary in many ships to introduce bulkheads between the engines and the men's sleeping quarters. As a result, the sleeping quarters became exceedingly warm, and this, with the accumulation of foul air, rendered sleep debilitating and lessened the power to assimilate food. In many ships the discomfort was so very great that a considerable number of men would, whenever the weather permitted, resort to the spar deck and sleep in the open air. This, to a certain extent, relieved the crowded condition of the lower deck, but subjected many of the crew to the excessive dampness, dews, and malarial and other influences incident to many climates. In damp weather, and also at times in clear, awnings were spread in port to prevent water from reaching the berth deck through the hatches or to protect the men sleeping in the open air. This diminished the movement of air between decks, and thus added materially to the closeness of all parts of the vessel. In addition to this, a ship with anchors down swings, on account of the excess of length over breadth, with wind and tide. It therefore happens that, even when smooth waters allow the air ports to remain open, the living space is generally deprived of the advantages of the natural cross ventilation considered so necessary in the hospital pavilion of to-day. This same wind, acting on a ship as if it were a vane, covered the whole vessel with the odor of fecal matter from the "head" at the bow, which, from faulty construction, no means of flushing, and very frequent use, it was practically impossible to either clean or disinfect. It is not desired to exaggerate this picture, so common in the days

of sailing ships and so intensified in the wooden steam vessels, now passing away. To accommodate the crew, hammock hooks were placed 14 inches apart, and the air space for each man on the berth averaged about 70 or 80 cubic feet. Ventilation depended upon a row of 7-inch air ports on each side, so near the water that, as a rule, even in port, they had to be closed; hatches in the deck, closed or hooded in very bad or wet weather; wind sails, frequently not used at sea and untrimmed or without wind in port, and an occasional metal ventilator turned by hand and frequently placed so low as to be excluded from the uncertain breezes. Much of this situation was, in the absence of artificial ventilation, due, as has been shown, to the fundamental shape of the ship itself.

The problem in an abstract way reduced itself to the ventilation of a space by a few openings in the ceiling or top with the natural condition of the outside air colder than within, and with the occasional aid of an air shaft, cowl, or wind sail. The mathematics involved, the method of computation, and the usual deductions are well known. They have, however, been often misleadng when applied to ships. The amount of air going into a space in relation to that coming out is by no means a measure of the general circulation in that space, and while it is true that under ordinary circumstances cold air falls and warm air rises, the result has to be interpreted in accordance with other circumstances. Some of these circumstances are that the deck overhead is broken by numerous large beams, which tend to imprison the foul and ascending breath and other exhalations of the sleeper swinging a short distance below, and that sides of ships are divided by knees and numerous projections, and present many corners. With but little motion in these places, the diffusive power of air and the exchange by gravitation are small when compared with its tendency to seek an opening or exit along the line of least resistance. As a result, the measure of the quantity of air supplied to a deck by a wind sail, ventilator, or cowl, and of that leaving by an adjoining hatch, are no true indication of the amount of fresh air that is being utilized. The colder air does not become generally diffused, its stream lines and flow are well defined, and the larger quantity moves to the nearest and largest exit. The eddies produced are not extensive, though

the draft is marked and at times dangerous. A short distance away the vitiated imprisoned air continues its slow exchanges, warmed by the heat of the ship and respiration, and loaded with carbon dioxide and animal exhalations. The same conditions also apply in some degree to simple exchanges through the hatches, the vertical circulation not being a true measure of the lateral extension. But even this important movement becomes much diminished when decks are multiplied, and when, as has often happened, the lower hatches are not placed directly below those above. Air ports would naturally, when open, assist materially in producing a general diffusion, especially when a disagreement between tide and wind in port caused the ship to assume the diagonal of the parallelogram of forces. Unfortunately, however, either the splash of water or the draft of cold air on individuals crowded against them has under such circumstances generally necessitated their closure. Besides, these ports, in spite of the packing employed, frequently leak, and drip cups have to be provided for the water at sea. Such cups are usually connected with the hold, from which the odor of the bilge and vitiated air have found a ready entrance.

This situation existed at a time when the knowledge of preventive medicine was increasing rapidly, and the microscope in intelligent hands was gradually substantiating the germ theory of disease, and leading to a better understanding of the conditions favorable to its propagation. Computations of the amount of carbon dioxide and organic matter in the living spaces became common, and increased attention was thereby directed to the necessity for improvement. That the problem was either difficult of solution or its importance not properly recognized by those in authority is shown by the large number of different appliances contrived, and the few ever adopted. In the majority of these, heat itself was naturally utilized, as it was not only on hand, but recognized as the great cause of the natural circulation of air everywhere. Improvements were, however, also made in wind sails, cowls, and various ventilators dependent upon natural forces, and much attention was given to the arrangement of uptakes and downtakes. The most noteworthy expedient, however, was practically the revival after more than a century of Sutton's

idea. This scheme, which was applied to not a few ships in foreign navies, involved the extension of the jackets of smoke-pipes downward in an expansion over the boilers. Air tubes were conducted from various parts of the ship to the space thus created, through which the hot air from the fire-room ascended. Communication was also made between the limbers and the ash-pits. In another system jets of steam were used in tubes to create an upward draft. But none of these changes became general; and in the United States, at any rate, the old conditions continued in spite of the most urgent representations of the danger and distress. Even the old routine of submerging the decks in water, almost daily, remained, and no amount of advice and disastrous experience prevailed against it. Typhus-fever was not unknown, various other contagious diseases became too common, and yellow-fever found a congenial home.

A fair illustration of the condition of these old wooden steam vessels, some of which still remain, is found in the history of the *Plymouth* as late as 1878–79. This screw corvette was first commissioned in 1869, and therefore fairly represents the faults in construction belonging to this entire period. In four years several hanging knees and considerable portions of the decks and outer planking were renewed on account of decay. This is an example of the methods of repairing at that time, and of the difficulties a complicated wooden ship presented in this line. Such parts as were open to inspection received much attention, but the repair of those concealed was largely dependent upon chance or an exhibition of weakness of structure. During the succeeding cruise much time was spent in warm climates, and cases of zymotic disease were reported in every month of the year, the most marked occurring in a captain of the hold, who exhibited cramps in the legs, nausea, vomiting, and fever. In a short time the *Plymouth* was recognized as a very unhealthy ship, and in 1878 she became infected with yellow-fever. Removal of crew and stores, repeated fumigations, applications of lime, freezing, and paint were resorted to, but on her return to sea from Boston, Mass., in 1879, the disease reappeared without possible reinfection. Then borings and cuttings of scuttle holes disclosed *cul-de-sacs* bounded by decayed wood, covered with

fungus growth and filled with decomposing filth and refuse matter. No amount of cleaning or fumigation could reach such places. Such spaces have existed in all wooden ships since the galleon first appeared, and under certain circumstances the results have been practically the same.

Another example, selected from the many available, may be found in the old wooden steam frigate *Colorado*, which, not many years ago, was considered one of the most powerful and perfect engines of war afloat. It was during a cruise on the European station that several cases of erysipelas were treated in the sick bay of that vessel. On her return home she was placed out of commission at Portsmouth, N. H., and subjected to the prolonged action of disinfectants. After many repairs and a sojourn of four winters in a cold climate, the ship was ordered to the China station, the writer being one of the medical officers. In the spring of 1870, during the passage to Hong-kong, by way of the Cape of Good Hope, several patients were admitted to the sick list with slight cuts and bruises. They were all quartered in the sick bay, and erysipelas developed in every case. In spite of every precaution, so persistent was the appearance of the disease in that one locality that an order had to be issued that no man with an abrasion, however slight, should go near the sick bay. Such instances might be multiplied, but would serve only to add in detail to a picture the outlines of which can be readily traced.

The introduction of steam on vessels of war was ultimately destined to exert a marked influence on the prevalence of intestinal disorders. The history of diarrhœa and dysentery is one of the dark chapters in naval life, and outside of the question of food, was largely dependent upon the quality of drinking water in use. During the whole period of sailing-vessels, and of steamers before the use of distilled water became general, it was not unknown for a large number of the crew to be attacked with these diseases shortly after a supply of water had been obtained from the shore. The questions of storage and supply had always occupied much time and necessitated much care. In many parts of the world water boats could not be obtained, and the necessary supply was either brought off in the ship's boats or floated off in casks. This work, in tropical climates, and often in the heat of the sun, was, out-

side of the question of injuries, often productive of unfortunate results. Besides, even after so much work and exposure, the water was frequently far from potable, and would seek its own purification by fermentation and putrefaction. An example of this is found in the history of the sloop of war *Swatara* at a time when the writer was her medical officer. It was in March, 1877, that the tanks of this vessel were filled at Norfolk, Va., with water from Lake Drummond, supposed to be most suitable for storage on shipboard. In a severe storm off Hatteras, lasting several days, this water was constantly agitated, its fermentation and putrefaction being also hastened by the heat and confinement of foul air between decks incident to a southern latitude and the closure of hatches. Sixty cases of acute dysentery developed in one day from its use, the disease disappearing rapidly when the distiller was employed. Such marked lessons have in time taught the great value of distilled water on vessels of war for drinking purposes, and have led to a general appreciation of the absolute necessity for its general use in the preservation of the health of crews.

It is true that the introduction of iron tanks, the appreciation of a greater need for cleanliness, and the employment of a more careful and exact examination into quality caused a marked improvement, but even after such changes there were at times more deaths from dysentery on one vessel in certain localities than occurred in the whole Navy after distillers were generally introduced. This innovation not only abolished the use of casks, but promoted personal cleanliness, improved the condition of the hold, and allowed more room for stores.

Probably the most striking event in the history of naval architecture is the substitution of metal for wood as a material for ships. Though this dates from about 1840, it may be considered, in our service, as starting with the construction of the *Monitor* in the days of the civil war. This vessel not only demonstrated the advantages of iron over wood for purposes of war, and revolutionized the methods of naval architecture, but also furnished a marked example of how sanitary ideas in shipbuilding have had their birth. In the fight between the *Monitor* and *Merrimac* it was found that there was not sufficient air in the turreted steamer for the crew, and that the

suffocating gases generated by the explosion of gunpowder found their way below and rendered it practically impossible for the men to work. Necessity, therefore, compelled the introduction of some apparatus for artificial ventilation. The old methods, in vogue for hundreds of years, had been retained, even under the new conditions, and but for the striking exhibition of direct interference with fighting capacity would have remained for many years longer. In the *Monitor* was placed a rotary blower worked by steam and practically similar to the Desagulier wheel of the preceding century. Air was thus drawn from one half of the steamer through a system of pipes and forced into the other. Various changes were made in later ironclads of this period. In some the air was drawn down the turrets and forced throughout the vessel, thus rendering them more than ever liable to suffocate the men below in battle, while in others the supply was obtained through armored cylinders and forced out through the turrets.

As an example of the condition of the early ships of the monitor type may be cited the history of the *Tecumseh*, which was ordered from the North in June or July, 1864, to Mobile Bay. Heavy weather was encountered during most of the voyage, so that there were but few hours, even after reaching the Gulf, when safety allowed openings for ventilation. Upon the arrival of the vessel at Pensacola, Fla., where the writer was stationed, out of the number of those whose duties kept them constantly below, the chief engineer and four men were taken from the ship insensible, along with others greatly prostrated by the vitiated air. None of them were in condition for duty when the vessel left for Mobile Bay, yet the chief engineer insisted upon being carried on board. He went down with the ship in the fight a few days after.

It was also in the early ironclads that a peculiar disease developed which, being confined to those vessels, was soon designated ironclad fever. In this affection the initial symptoms were much like those of typhus, but in a short time severe occipital pain was followed by complete aphonia, and this by coma and death. The introduction of ventilating appliances caused the disappearance of this singular disease, and in time these metal boxes, almost entirely submerged, came to be regarded as probably the most salubrious vessels

afloat. The mechanical means of ventilation now introduced was not, in spite of this object lesson, generally applied, for even as late as 1880 there was only one cruiser in the United States Navy in which this system was in use.

The monitor type, the scarcity of lumber in England, the increase in the size, power, and efficiency of ordnance necessitating greater strength, the economy and other manifest advantages of iron in shipbuilding, and the improvements in metal working were, however, together with other considerations and the plentifulness of iron, effecting a general change in naval architecture. In a short time it became evident that the days of wooden vessels were numbered, and then all maritime powers hastened to construct the present engines of war —veritable steel forts, whose history is yet to be made.

In comparing the navy of the present with that of the past it may be stated that, from a sanitary point of view, the most important changes are closely associated with the difference in material of construction. Iron rusts and wood decays. The one is purely chemical, while the other is vital. The one is a simple process of oxidation, hastened by moisture and probably by electrical disturbances, but, as a rule, entirely independent of vital influences; the other is usually a complicated change—a variety of death—in which complex molecules formed by plant life are broken down into simpler compounds through the influence of animal and vegetable parasitic growth. The one is comparable to a slow burning, the other to a putrefaction. A decayed ship is, therefore, much like a dead body, particularly in those parts most subject to bacterial and fungous growth. The difference between the present ship and that of the past, in this connection, is therefore very evident.

The physical properties of wood and iron also differ in the one being absorbent and full of cracks and crevices for the accumulation of filth and the other impervious and its pieces capable of a more complete coaptation. These considerations have a very evident and important bearing upon infection, air pollution, cleanliness, and disinfection. Iron is also lighter than wood, strength for strength. This favors increased tonnage, provides more space, and, in lessening the size of beams and knees, furnishes fewer obstructions to the circulation of

air. Armor plating of sides and increased weight of ordnance have also caused greater beam and tonnage, and, with abolition of sail power, have diminished, relatively, the number of men and largely increased the cubic air space per head. But iron and steel have a much greater specific gravity than wood, or water even. While every part of a wooden ship would float, the opposite is true of iron. Consideration of safety at sea and in battle have led to the division of a ship by bulkheads into a number of water-tight compartments, and to the construction of a double bottom. The latter extends across the bilge, and is of course absolutely water-tight when the manhole plates are on. The air between the bottoms is therefore entirely stagnant and the space dry, though drainage is provided into wells which could be emptied by powerful pumps. The bilge of a modern man-of-war is, therefore, from a sanitary point of view, outside the vessel, as its air is confined and it is shut off from the receipt of any refuse material whatever. Yet now that it has ceased to menace health, no portion of a ship receives greater care and attention, for the question is not one of sanitation, but of preservation of structure—the life of the ship, and not that of the men. Manhole plates are lifted with regularity, air is renewed by portable ventilators, and men are specially employed to crawl through the space and take care of the metal bottom, which seeks to destroy itself by rusting. The old story of the bilge has, however, come to an end, and new conditions have arisen to confront the sanitarian. But with the growth of knowledge in all parts of the world, the advance in mechanical invention, the rapidly growing insight of medical and surgical minds into the cause of disease, and the more general diffusion of information on matters relating to health, there appears at least a promise of the abolition of the surroundings necessary for the existence of many diseases long considered the curse of the human race.

The arrangement of guns in turrets and in other systems, occupying the former spar deck, occluding to a great degree its openings and abolishing the old gun ports, and the division of ships into compartments, creating a number of confined spaces in which men have to sleep and work, have led, from necessity, to the introduction of mechanical means for the

withdrawal of vitiated air between decks and the supply of pure air, which has surrounded all seagoing vessels from the beginning. The appliances for this purpose have been so improved that it is now possible by the use of the rotary fan to extract from or force into each compartment any desired quantity. The incoming air is, however, not warmed, and this, with the small amount of cubic space occupied by each person, limits the supply necessary for a proper renewal. The question of drafts thus assumes a place of the greater importance in the problem, and its comparative solution becomes a question of great moment. Besides, the amount of air going into a space and the amount coming out are not a true indication of the general circulation. In this connection it is also apparent that the smaller the number of openings of entrance and exit the more rapid will be the circulation in certain localities for any given supply and the less the diffusion. Room for improvement is therefore apparent in the direction of increase in apertures—the maximum being the entrance and departure of air through openings as multitudinous as those in gratings everywhere distributed. The mechanical difficulties are, however, far from small, and considerations of cleanliness would also have to be successfully met. Even now the ventilation of certain spaces is much diminished by friction in pipes increased by bends. These and other recognized defects, often apparent, lead to the expression of opinion that each important compartment should have its own ventilating system of sufficient power, and that the greatest movement of air compatible with health should be secured by scientific experimentation made by persons having this duty assigned them. The subject has now come within the range of mathematical precision, but accuracy can only be secured by a regularly organized supervision and a sense of individual responsibility.

The question of moisture on vessels of war has now presented itself under new circumstances. The old contention of wet or dry decks seems to have been definitely and satisfactorily settled the world over. Knowledge on the subject has at last become the common property of nearly all naval commanders. Great care is now exercised in frequently covering all berth decks with shellac or other mixtures, and in

securing cleanliness with the smallest amount of warm water. But the change from wood to iron as a material of construction has caused new but not unexpected difficulties in this connection. Wood is a poor conductor and absorber of heat. Iron heats and cools rapidly. A metal ship is, therefore, exceedingly warm in tropical summers and cold in the winters of high latitudes. The latter is to a great extent controlled by the plentiful use of steam confined in coils, but the skin of the vessel remains exceedingly cold, and to any one sleeping near it seems much like ice itself. The former is limited by the application exteriorly of white paint, as this color promotes the reflection of the sun's rays. Both are much diminished by an inside sheathing. This has become common in officers' quarters where bunks are provided, but its continuance is problematical, inasmuch as recent experience in war seems to have disclosed the danger of conflagration in battle. The property possessed by metal of cooling rapidly reduces the power of air in contact with it to retain moisture. As a result, water is deposited in quantity depending upon the state of the atmosphere and the coldness of the surface to which it is exposed. The phenomenon is known as "sweating," and the condition is one exceedingly detrimental to health. It is true that so long as the condensation continues uninterrupted the air is deprived of moisture, but as the ship is heated by the sun, a rapid evaporation ensues and human exhalations that would have escaped are suddenly set free. Besides, the organic poison from the skin and breath are by this water carried to a certain extent over the ship, inasmuch as the different parts are arranged so as to drain into wells on the upper surface of the double bottom. Fortunately the presence of water on iron facilitates rusting, and thus excites apprehension relating to its durability. It also in this manner tends to mar the clean surface of the paint work and to destroy the beauty of cleanliness. This has led to the use of paint containing a considerable quantity of cork, the wood acting as an excellent non-conductor. The difficulty, though not entirely met, has been considerably reduced, and promise is given that the future has much-needed improvements still in store. This question, however, as has been indicated, is not one confined strictly to the physical properties of the

material of construction. The relation existing between ventilation, the temperature of air between decks, and this tendency to the deposit of moisture is one demanding more attention than it has ever received. Inasmuch as a vessel of war may be required for duty along the coasts of any country where human beings can live, efficiency will depend to a great extent upon the adaptability of structure to rapidly changing climatic conditions. The supply of heat in connection with ventilation, therefore, assumes a prominent place, especially as upon this depends in a great measure whether a ship will be dry and wholesome or the reverse. It is, therefore, of vital importance that the distribution of heaters and area of heating surface should be considered in connection with ventilation, size of space, and probable or possible variations of temperature of outside air and water. Such attention this subject does not, to say the least, always receive, the desire being too often to free the decks as much as possible from steam heaters and to leave the supply rather to guesswork and supposed economy of space. It is, therefore, not unknown for a sick bay and berth deck to have for weeks an average temperature of 51.5° F., with a maximum of 60° and a minimum of 44°. As a result heavy frost has appeared on the ship's sides and bulkheads, and at times it has been necessary to protect the sick in their cots and hammocks by rubber sheets spread overhead. The effects of such a condition upon health and the determination of disease needs no comment.

Much has been said and written in regard to the treatment of disease occurring at sea. It would appear, however, that the portion of the ship set apart for the sick has much to do with the result in a large number of cases. The traditions of hundreds of years have fastened the idea that a place at the bow must be devoted to this purpose, though it is the most unfit for the service to be performed. The shape of a vessel and the condition of being afloat render this the point of greatest motion, and, owing to the hawse holes, the one most liable to be flooded by the sea. It is the one place in which air ports must be kept rigorously closed at sea, and, barring the engine, it is the noisiest locality on shipboard, though even this exception cannot be made when the chain rushes through as the anchor goes down or follows the anchor engine

in its rounds. The effect of the ship's motion on the sick has never probably been thoroughly investigated, but doubtless in pneumonia and other acute diseases it tends to paralyze a heart already much weakened. It certainly increases the difficulty in the management of a variety of injuries.

In conclusion it may be stated that it has not been the intention to treat the subject of naval architecture and ship-sanitation in any but a general way. Details have to be worked out from general principles with the aid of individual experiences. Valuable lessons may, however, be learned from the history of each subject of importance, and surely even an incomplete study of the causes of the mortality of the sea will not prove an exception. Perhaps the one fact that stands above all others is that suffering, so closely associated with wounds on shipboard during action and with disease and death, in spite of the irretrievable loss it entails, has influenced but little the minds of men who have built from the beginning the great navies of the world. Changes have occurred from considerations relating to the durability of ships and their perfection as engines of war. The mariner's compass, gunpowder, and steam have each marked an era in shipbuilding, and though the mortality of seamen has been greatly reduced, they each tell the same story of human life depending, so far as naval architecture is concerned, upon the preservation of wood, strength of structure, and conditions evolved during battle. Now the iron or steel age begins. Shall we learn any lesson from the past, or will future ages trace out the same indifference to the life of man? It is believed that such is not the tendency of the time.

The writer desires in closing to express his appreciation of the able assistance rendered him in the preparation of this paper by Past Assistant Surgeon J. D. Gatewood, United States Navy, Museum of Hygiene, Washington, D. C.—*From Annual Report to the Secretary of the Navy*, 1895.

## THE DESTRUCTION OF PRIVATE PROPERTY DANGEROUS TO HEALTH.

ALTHOUGH the right of the health authorities to destroy private property, when the same endangers the public health, is universally conceded, a question sometimes arises as to the

right of the owner to compensation for the value of the property destroyed. Such a question was recently before the Supreme Court of Georgia, in the case of Mayor, etc., of Savannah *vs.* Mulligan. The court held that the municipal authorities of a city have no right to destroy the private property of a citizen for the public good without compensating him for the loss thus occasioned, unless the property is itself a nuisance, endangering the public health or safety. In that event it may be destroyed by such municipal authorities, without paying the owner its value, if the charter of the city confers upon them the power to abate such nuisances; but even then, unless the property is first condemned as a nuisance by appropriate proceedings, its destruction will be at the peril of the municipal authorities; and when sued for its value the burden is on them of showing that it was in fact a nuisance, and that its destruction was really necessary to the public health or safety. In cases of emergency the destruction may properly be ordered without a preliminary condemnation, but the municipal authorities will in that event carry the same burden. The court said:

"This was an action against the municipal corporation of the city of Savannah for the value of a feather bed, pillows, and mattress destroyed by a sanitary inspector of that city, under orders of its health officer. On certiorari the Superior Court ruled that the city was liable to the plaintiff, under Section 2226 of the Code, and to this ruling the city excepted. The section referred to is as follows: 'Analogous to the right of eminent domain is the power from necessity vested in corporate authorities of cities, towns, and counties, to interfere with and sometimes destroy the private property of the citizen for the public good, such as the destruction of houses to prevent the extension of a conflagration or the taking possession of buildings to prevent the spreading of contagious diseases. In all such cases any damages accruing to the owner from such acts, and which would not otherwise have been sustained, must be paid by such corporation.'

"We do not think the section above quoted is applicable to this case. Under the ruling of this court in Dunbar *vs.* City Council of Augusta, 90 Ga. 390, 17 S. E. 907, a city having the power, under its charter, to abate nuisances endangering the public health and safety, may destroy property without making compensation to the owner, where the property constitutes a nuisance of that kind; and we think the decision in that case controls the present case. There the city authori-

ties destroyed grain which had become wet and damaged by a flood while stored in the plaintiffs' warehouse. The plaintiffs sued the city for the value of the grain, and it was held by this court that, 'it not being alleged in the declaration that the damaged grain condemned and destroyed by the municipal authorities was not a nuisance or was not dangerous to the public health (that being the ground on which it was condemned and destroyed), no cause of action against the municipality was set out in the declaration.' Bleckley, C. J., in delivering the opinion of the court, said: 'To destroy property because it is a dangerous nuisance is not to appropriate it to the public use, but to prevent any use of it by the owner, and put an end to its existence because it could not be used consistently with the maxim, *Sic utere tuo ut alienum non lædas.*' Section 2226 of the Code, though not referred to in the opinion, was cited and relied on by counsel for the plaintiff in error in that case, and was not overlooked by the court in the consideration of the case. An illustration of the class of cases to which this section applies will be found in the case of Town of Dawson *vs.* Kuttner, 48 Ga. 133, the only case we know of in which the section referred to has been construed. In that case the plaintiff was held entitled to recover from the municipal corporation for property destroyed by the authorities thereof in attempting to prevent the spread of a fire, but the fire did not originate in and had not extended to the property in question at the time of its destruction. In cases of emergency the municipal authorities, if authorized by their charter to abate nuisances, are not bound, before ordering the destruction of property as a nuisance, to wait until the fact that the property is a nuisance is judicially determined. In such cases the destruction may be ordered without a preliminary condemnation. (See Mayor, etc., of Americus *vs.* Mitchell, 79 Ga. 807, 5 S. E. 201; Dunbar *vs.* City Council of Augusta, *supra*, and cases cited.) Unless, however, the property is first condemned as a nuisance by appropriate proceedings, its destruction will be at the peril of the municipal authorities; and, when sued for its value, the burden is upon them of showing that it was in fact a nuisance, and that its destruction was really necessary to the public health and safety. In the present case the evidence showed conclusively and beyond question that the property destroyed was in fact a nuisance endangering the public health, having been used as bedding by a person who had scarlet-fever, a highly contagious disease; and the mayor and aldermen of the city, under its charter, had ample authority to abate the nuisance (Code, § 4875). Consequently the destruction of the property was awful, and the owner was not entitled to recover its value from the city."

# THE EGOTIST'S CURE.

By Hudor Genone.

A certain egotist, surfeited with the sordid world and desirous of ridding himself of all contact with his kind, left the vicinity of his abode, and went to a lonely place on the sea-coast where he could commune in peace and solitude with himself and nature and dream, unvexed and uncontaminated, lofty dreams of the eternal and illimitable.

He would have liked better had his nature been of an order to dispense with even the inn, but unfortunately he was mortal, and being so, at times craved nutrition, and nutrition, as he well knew, exacted cooks. A roof, too, and a bed were essential, so unwillingly but of necessity he put money in his purse, and having arranged for accommodations at the inn, spent his time upon a rocky cliff, far from the haunts of men, that overlooked the sea.

And yet he was not altogether happy, for at the inn was a young woman who had come there with her parents, and she, giddy as most maids of nineteen or so, having innocently made acquaintance with him, was wont to rally him upon his solitary life and ask him questions, some of which, wise as he was, he could not answer.

But it was these very unanswerable questions that set him thinking all the more. One day he was at his accustomed cliff alone, with the blue of the sea before him and of the sky above and the fiery sun dropping slowly down, he mused his fill.

"All this is mine," he thought, "for me, for the ego that is me was all this made; for me, out of the chaos of nothing the spirals whirled slow and swift, evolving a vast sphere of fire, then a little ball revolving, first fire, too, then viscous, and at the last, little by little, fitter and fitter, to this very hour, all for me. How wonderful am I—I the centred self of infinity, the soul of eternity, master of matter, divinity of destiny."

So he mused, "the world forgetting, by the world forgot." But not quite that; for the sun dipped down into the sea, and the lengthening shadows told our philosopher of the flight of time, and feeling—base, carnal, thoughtless feeling—

twitched him within, reminding of supper at the inn. Then he turned his face earthward, and as he turned there, framed against the glowing sky, a thing of beauty, stood the little minx.

There she stood directly in his path. But it was not alone the physical reality that disturbed him ; no, worse than that, for of a sudden the unbidden thought rushed at our egotist and jostled and shook him rudely.

" Wake up, dreamer," it cried, " wake up and contemplate a fresh revelation. For this being, this little minx, out of the chaotic nothingness the spirals spun the planets, and the great sun, and made the grass grow, and bit by bit manufactured her sweetness and foolishness—another centred self, a soul of eternity, a mistress of matter, a divinity of destiny."

The result was natural. The egotist was quite young, and, apart from his egotism, not ill-favored. So the cares of this world and the needs of looking after a family in time cured even that ; he married the minx.—*From " Fables from the New Æsop." The Open Court, No.* 429.

## MEDICAL EXCERPT.

By T. P. Corbally, A.M., M.D.

Mortality from Diphtheria since the Introduction of Serum.—M. Henri Monod has made a report to the Académie de Médicine (*La France Médicale*, December 20th, 1895), that, from January, 1895, since the knowledge of anti-diphtheritic serum and its uses have been extensively diffused throughout France, the statistics have shown a diminution in the mortality from the disease always increasing.

In the population of 108 cities in France, each having more than 20,000 inhabitants—the only places from which the reports are regularly sent to the central administration—during the first six months of the seven years preceding 1895—that is to say, from 1888 to 1894, the average number of deaths from diphtheria was 2627. During the first six months of 1895 the diminution was 65.6 per cent. This diminution is not simply continuous ; it is steadily increasing, as is proved by statistics from month to month.

It would be interesting to compare the number of deaths

with the number of cases of the disease, and it ought to be possible, since diphtheria is in the list of diseases prepared by the Academy of Medicine that are to be reported according to the law in such cases. Unfortunately, the compliance with the law meets with many difficulties and in all cases does not give sufficient satisfaction to serve as a basis for detailed statistics.

Diphtheria is known to be as fatal in the country as in the large cities. It is not unreasonable to estimate at 15,000 the number of persons whose lives have been saved annually in France by the use of anti-diphtheritic serum.

IMMUNITY AFFORDED BY VACCINATION AND THE ACTION OF THE SERUM OF THE VACCINATED ANIMAL IN AFFORDING PROTECTION FROM SMALL-POX.—M. A. Béclère presented to the Académie de Médicine, in his own name and in that of MM. Chambon and Saint-Yves Menard, a communication (*ibid*), in substance as follows: The serum of the vaccinated heifer, outside of the period of its violent action and after the drying of the pustules, possesses an action which affords an immunity which is due to the soluble substances that it contains.

In proportion as the development of the consecutive immunity afforded by subcutaneous innoculation with vacinal virus is slow, just so is the almost immediate and preventive action of the serum of the vaccinated animal rapid in its development. Besides, it has effects which are not only preventive but therapeutic. Injected under the skin of an animal which had been innoculated two days before, it shows still in a very evident manner its power to prevent the further development of the disease.

Whether preventative or curative, the immunity afforded by the serum of the vaccinated heifer is not limited to a single result, but admits a whole series of degrees which varies with the dose injected and with the time, more or less remote, from the beginning of the development of the vaccine where the injection was made.

This action is revealed and is measured by two signs—an arrest of development, more or less pronounced, of the eruptive elements and an attenuation, more or less complete, of the virulence of their contents of the pustules.

To be more exact: the serum of the vaccinated heifer, injected under the skin of an animal of the same species in the dose of the centime of its weight immediately before the vaccination, by means of many innoculations beneath the epidermis, confers, on the animal, a degree of immunity sufficient to render sterile the greatest number of innoculations and to give to the few eruptive elements a rudimentary and aborted appearance, and especially to cause all appreciable appearance of virulence to disappear in the contents of these sparse elements, because it is no longer possible to innoculate subjects that have not been vaccinated, whether children or heifers.

MM. Béclère, Chambon, and Menard think that the result of their experimental researches permits them to attack, while resting on a solid basis, the problem of serumtherapy in variola and that it has become legitimate to try against this disease the use of a serum possessing curative properties against vaccine. So Dr. Béclère has made, since the beginning of the year, in fifteen cases of variola of all ages, subcutaneous injections of the serum of vaccinated heifers. He will soon make public the results of his experiments with it as a therapeutic agent.

PUNCTURE OF THE PERICARDIUM.—M. Delorme makes the following report to the Académie de Médicine (*ibid*): Examinations made in the cases of 60 dead bodies show that the pericardium has more close and extended relations with the sternum and the border of the pleura than is generally imagined. In order to be certain to avoid the pleura in such operations, it is necessary to follow the edge of the sternum closely, or, better, to pass inside of it on a level with the third, fourth, and fifth intercostal spaces. In a patient suffering with hydropericarditis the puncture at the accustomed point has been known to open the pleura; in another case M. Delorme has punctured the pleura and caused hydropneumathorax. The incision at the usual point thus exposes the patient to an immediate attack of pneumothorax and to a very acute effusion, which most seriously endangers the action of the heart.

When necessary to puncture the needle should at first follow the sternal edge of the bone, then the posterior surface for the distance of a centimetre, to enter then into the peri-

cardium. The peculiarity of this mode of incision consists in the separation of the left border of the pleura and in turning it outward. The pericardium is easily recognized by its color, which is of a pearly whiteness, is then seized with a forceps and incised with the aid of a director. It is true that in order to do this it becomes necessary to resect the third, fourth, and fifth cartilages, and at the same time preserving the connections of the third cartilage. This operation is largely compensated for by the great advantages that result in the safety it affords the patient and the satisfaction to the operator.

NEURALGIA IN GOUTY PERSONS.—Dr. Cagney (cited in *The American Year Book of Medicine and Surgery*, 1896) makes the following suggestions as to the treatment of neuralgias:

"In anæmic neuralgia, arsenic is the best remedy; in the gouty state, besides the ordinary remedies, he finds colchicin in one-thirtieth-grain doses and muriate of ammonia in 20-grain doses particularly useful. The latter agent, which has long been vaunted as an anti-neuralgic, the author thinks owes its reputation to its great efficacy in those cases in which a hypnotic stimulant and an agent to promote metabolism is needed. For the obscure pains from which gouty subjects suffer, and especially for a form of enteralgia probably dependent upon duodenal indigestion, he recomends piperazine very highly. In doses of five grains, with alkalies and carminatives, it seldom fails." The value of piperazine in the neuralgias of gouty persons would seem to be dependent upon its power of keeping the uric acid in a soluble state and favoring its elimination from the system by way of the kidneys. It thus neutralizes directly the materia morbi, and if its use be persisted in, it will act as a preventive of further attack. The observations reported from private and hospital practice during the past few years demonstrate that piperazine (Bayer) is one of the best remedies at the command of the physician for the treatment of various manifestations of gout. Much will of course depend upon the selection of a chemically pure preparation.

PUNISHMENT OF AN ANTIVACCINIST.—The Supreme Court of the German Empire has recently pronounced sentence and

ordered judgment in the following case: Dr. Max Böhm (Friedrichroda), a determined opponent of vaccination, some time ago was prosecuted for having certified to the successful vaccination by him of several children. The public prosecutor held that this vaccination was fictitious, inasmuch as a diluted lymph, incapable of conferring immunity, had been employed. The decision of the court at Gera, where the case was tried, was unfavorable to the defendant, but this judgment was reversed by the Supreme Court at Leipzig.

But the health authorities, instead of acquiescing in their defeat, again brought him up before the court at Gera on the same charge in May last. The court sentenced the defendant to two months' imprisonment. An appeal was again taken to the Supreme Court, but this time the judgment was sustained.

## EDITOR'S TABLE.

### SANITARIAN, FEBRUARY NUMBER, 1896.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

ANTITOXIN continues to be the accepted remedy in the treatment of diphtheria by the leading physicians, and the too exclusive reliance of the sanitary authorities everywhere, notwithstanding Mr. Lennox Browne's published statements and Dr. John B. Hamilton's echo of its dangers, to which allusion was made in our January number. Dr. Hermann M. Biggs, pathologist of the Health Department of New York, to whom belongs the credit of introducing the remedy in this country, on a recent visit to Chicago, in an interview with the Health Commissioner of that city, took occasion to say (Chicago *Tribune*, January 8th):

"Taking all cases into account—those treated early and late—the mortality in diphtheria cases in New York for four weeks ending December 22d, 1895, was 16.6 per cent. For the same period in 1894 the mortality was 24.5 per cent, and in 1893 it was 36.6 per cent.

"Conditions in Chicago are much more favorable for the treatment of the disease than in New York. We have a great tenement-house population, more than 800 to the acre, a denser population than at any other place in the world. Light and ventilation are bad, and it is among these people

cases run until the fourth and fifth day before notification is received at the Health Department, and then it is often too late. The Health Department supplies all institutions and poor patients with the serum free of charge. There are 50 stations for its distribution. There are three grades of serum, the first and second for use in mild and first-stage cases, and the third for severe cases. One year ago these cost, according to grade, $4.25, $8.50, and $12.50 a phial or dose. The cost now is 50 cents, $1, and $1.50.

"There is not a single pathologist or bacteriologist of note in the world to-day who opposes the use of antitoxin."

DIPHTHERIA, nevertheless, at the time of this writing is the most universally prevalent of all infectious diseases, and is causing more deaths than any other disease except consumption.

## MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA.—*Mobile*, 31,076: I. A. Abrahams, M.D., Health Officer, reports for November total number of deaths 63—17 under five years of age. Annual death-rate, 36.24.

ARKANSAS (Little Rock *Gazette*, January 14th) *Conway*, January 13th.—A. J. Witt has returned from the *small-pox* district, and reports one negro woman at Mayflower, ten miles from here; 6 cases at Gillam's (colored), fourteen miles from Conway; 2 at Paul Jones' (colored), which is fourteen miles from here, and Mrs. McCormick (white), fourteen miles from here.

CALIFORNIA.—J. H. Davison, M.D., President, Los Angeles; J. R. Laine, M.D., Secretary, Sacramento.

The Secretary reports from 57 localities for December, aggregating a population of 773,370, 1031 deaths—15.96 per 1000 per annum. From consumption, 85; diphtheria, 18; typhoid-fever, 20.

*San Francisco*, 330,000: Deaths, 514; from consumption, 76; diphtheria, 6; typhoid-fever, 9.

Annual report for fiscal year ending June 30th, 1895: Deaths, 6059; from consumption, 1080; typhoid-fever, 123; diphtheria, 48; violent deaths, 339. Death-rate, 18.36.

*Los Angeles*, 80,000: Deaths, 114; from consumption, 29; diphtheria, 4; typhoid-fever, 3.

*Oakland*, 60,000 : Deaths, 66 ; from consumption, 7.
*Sacramento*, 30,000 : Deaths, 36 ; from consumption, 5.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President ; Professor C. A. Lindsley, M.D., Secretary, New Haven.

*Monthly Bulletin* reports for December from every town in the State, 1116 deaths—75 more than in November, and 113 less than the average number of deaths in December for the five years preceding. Death-rate, 16.4 for the large towns ; for the small towns, 16.1, and 16.3 for the whole State. Deaths from consumption, 139 ; *diphtheria* (and croup), 57 ; *typhoid-fever*, 16. Diphtheria was chiefly prevalent in Bridgeport, Bristol, and New Haven.

COLORADO.—*Denver* (*News*, January 13th), 145,000 : Deaths, 1600 ; death-rate, 11.04. When it is considered that 250 of the 1600 deaths were those of consumptives who came here too late to be cured, the rate becomes phenomenal.

DELAWARE.—E. W. Cooper, M.D., President, Camden ; E. B. Frazer, Secretary, Wilmington.

State Sanitary Statistics (*Every Evening*, December 20th). The Secretary reports local boards of health organized in the State, about the middle of October last, as follows : Wilmington, Newark, St. George's, Townsend, Clayton, Kenton, Dover, Felton, Harrington, Milford, Seaford, Milton, Lewes.

*Without boards of health :* Centreville, Henry Clay, Stanton and Marshallton, Newport, Christiana, New Castle, Hockessin, Glasgow, Cheswold, Magnolia, Frederica, Hazlettville, Centerbury, Farmington, Greenwood, Georgetown, Whitesville, Dagsboro, Millsboro, Bridgeville, Roxana, Delmar. In these towns the health of the people is in the keeping of the town commissioners. Cases of *typhoid-fever* reported by resident physicians during the year : Centreville, 15 ; Henry Clay, 10 ; Stanton, 12 ; Glasgow, 15 ; Millsboro, 5 ; Bridgeville, 5 ; Delmar, 6. From Summit Bridge, Rockland, Claymont, Greenboro, and Frankford no reports received.

*Salem* (Wilmington *Republican*, January 4th).—*Diphtheria* prevalent. New cases of diphtheria are reported daily, and in many cases it develops in the most malignant type. In spite of the efforts of the Board of Health, who enforce strict

quarantine, the disease is spreading and has assumed a phase that threatens a serious epidemic.

DISTRICT OF COLUMBIA, white, 187,600; colored, 87,900—275,500: W. C. Woodward, M.D., Health Officer, reports the number of deaths for the four weeks ending December 28th, 406, of which number 198 were of colored people. Death-rate, white, 16.3; colored, 24.7. Deaths from *typhoid-fever*, 21; diphtheria, 14; consumption, 4.

The grand jury has filed a report upon the health and sanitary condition of the district, urging and requiring that a system of sedimentation and filtration in connection with the water supply is primarily necessary; that the water supply is entirely inadequate and should be increased; that as opportunity offers, all pumps and wells used for drinking purposes should be closed; the discontinuance of box privies; improved house drainage and sewerage; more thorough inspection of the milk supply; sanitary improvement looking to the reclamation of the Potomac marshes; and the requirement of physicians to promptly report to the Health Department all cases of infectious diseases.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M.D., State Health Officer, Jacksonville.

*Official Bulletin* of December summarizes the reports of 5 cities and 45 counties, with an aggregate population of 391,422: Deaths, 294; annual death-rate, 8.91. Deaths under five years, 99.

*Pensacola*, 15,000: Board of Health reports: Deaths, 19; death-rate, 15.2.

GEORGIA (Augusta *Herald*, January 1st).—President Foster, of the Board of Health, reports a marked progressive decrease of the death-rate for the past fifteen years, divided into periods of five years each: 1880–84, inclusive, 24.52 per 1000; 1885–89, 23.32; 1890–94, 19.51. For the year 1894 the death-rate among the white population was 11.36 per 1000, and in 1895 it was 11.39 per 1000; a death-rate rarely ever equalled by any city in America of the size of Augusta.

ILLINOIS.—William E. Quine, M.D., President, Chicago; J. W. Scott, Secretary, Springfield.

*Chicago*, 1,600,000: William R. Kerr, Commissioner. Official report for December: Deaths, 1776, of which 616 were under five years of age. Death-rate for the month, 1.10. Death-rate for the year ending December 31st, 15.12. Deaths from *diphtheria* in December, 173—28 less than previous month; typhoid-fever, 42—15 less than previous month; consumption, 172.

The antitoxin treatment of diphtheria is persisted in, and the results obtained by its use are cited as the most conclusive proofs of its value. It is shown that out of 629 cases treated 591 recovered. Only 38, or 6 per cent, of the whole number died, and there were no deaths in the cases treated within twenty-four hours after the disease had made its appearance. Of 437 persons exposed to contagion and immunized not one contracted the disease.

The *Inter-Ocean* of December 21st contains a long letter from Dr. Hamilton to Commissioner Kerr, defending and explaining his criticism on the use of antitoxin, in which he lays special emphasis on the fact that it is devoid of prophylactic virtues, and that reliance upon it tends to divert attention from other—and in the end—more effectual methods of suppressing the disease.

INDIANA.—(Indianapolis *Journal*, January 4th). The State Board of Health has issued a set of new rules for the government of county and local boards of health. One of the most important changes is the placing of typhoid-fever on the same level as small-pox and yellow-fever in regard to quarantine measures. Diphtheria is also to be quarantined.

The following resolution adopted by the State Board at its last meeting is also included:

*Whereas*, It has been fully demonstrated by physicians, both in private and hospital practice, that antitoxin is the best means for the cure and prevention of the much-dreaded contagious disease diphtheria.

*Resolved*, That the Indiana State Board of Health, recognizing its value, does hereby indorse and advise its use by the local health officers throughout the State, both for prevention, cure, and control of epidemics of said disease.

IOWA.—Frederick Becker, M.D., President, Claremont; J. F. Kennedy, M.D., Secretary, Des Moines.

*Official Bulletin* reports for the month of November the unusual prevalence of *diphtheria* in Clinton and Council Bluffs; and "a mystery unravelled" of its prevalence in Boone from October 1st, 1894, to October 1st, 1895, as furnished by Jesse L. Hull, the city clerk.

The total number of deaths, as shown by the report, is 109. Of this number 28—more than one fourth—died of diphtheria! In this mortality from diphtheria we include 2 cases reported as "membranous croup;" 1 case of "diphtheritic croup;" 1 case of "croupous pneumonia;" 1 case of "dropsy" following diphtheria; and 1 case of "paralysis" resulting from diphtheria.

An article appeared lately in the *Iowa State Register* that throws a great deal of light upon this subject. It was a reprint from the Chicago *Christian Oracle* (!) of a paper contributed by *Rev.* J. H. Painter, State Evangelist, and used as an advertisement of a certain alleged cure for diphtheria. The part of this advertisement that is applicable to Boone is as follows:

O. J. Halliday, of Boone, Ia., on March 24th, 1894, ordered a package to test and introduce. On March 30th he ordered two more; on May 7th following he ordered a dozen boxes, four days later another package, and on May 17th two dozen more; on October 29th another dozen boxes, and the next month another dozen. *He kept this up as diphtheria would break out from time to time, until* 175 *to* 200 *cures have been perfected.* At one time a Boone paper published the statements of 12 families representing 33 cases, reporting cures "without the aid of attention by doctors."

We have never known such a record as the above. We are not criticising the remedy so much as the method of application. We believe this treatment without physician, and perhaps without quarantine, is responsible for the disease breaking out from time to time until at least 600 cases must have occurred in this usually healthful city.

*Davenport*, 31,484: A. W. Cantwell, M.D., Physician to Board of Health, reports for December: Deaths, 35—7 under five years of age. Death-rate, 13.1.—January 8th (Davenport *Leader*): Cases of *diphtheria* reported during December, 10; deaths, 1.

KENTUCKY (Louisville *Courier Journal*, January 4th).—

Health Officer White reports for the month of December: Deaths, 293; from *typhoid-fever*, 14; *diphtheria*, 12; consumption, 41.

LOUISIANA.—S. R. Oliphant, President, New Orleans; W. R. Harnan, M.D., Secretary, New Orleans.

*New Orleans*, 275,000 (80,000 colored): S. R. Oliphant, M.D., President.

The mortality for five weeks ending January 4th was 765—307 colored. The annual death-rates per 1000 were: whites, 27.55; colored, 40.5; total, 32.45. Deaths from *diphtheria* (and croup), 14; *typhoid-fever*, 12; *small-pox*, 10. During the year 1895: Cases of small-pox reported, 298—white, 88; colored, 210. Deaths, 56. Cases on hand at date: white, 4; colored, 25.

MAINE.—C. D. Smith, M.D., President, Portland; A. G. Young, M.D., Secretary, Augusta.

*Portland*, 40,000 (*Press*, January 10th).—Secretary Dyer reports deaths for the four weeks ending December 28th, 62; death-rate, 20.15. From *diphtheria*, 13; *typhoid-fever*, 3.

*Eastport*, January 6th (Bangor *News*, January 7th).—*Diphtheria* has made its unwelcome appearance in two or three families, and 2 deaths are reported.

MARYLAND.—John Morris, M.D., President, Baltimore; James A. Steuart, M.D., Secretary, Baltimore.

Quarterly meeting of the State Board, January 9th, the Secretary reported that he had visited *Havre-de-Grace*, where there had been 12 cases of *diphtheria*, with 2 deaths from that disease in December, and urged the organization of a local board of health. A board had been instituted, and a very good health ordinance had been passed by the Mayor and City Council.

*Baltimore*, 496,315—73,747 colored: James F. McShane, M.D., Health Commissioner, reports for December: Deaths, 987—209 colored. Death-rates: white, 22.07; colored, 33.89: 23.87. Three hundred and eighty-nine—39.41 per cent of the deaths were under five years. Deaths from *diphtheria*, 55; *typhoid-fever*, 13; consumption, 120.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M.D., Secretary, Boston.

The State Board Report for the year 1894—twenty-sixth annual report—is a volume of 1047 pages, comprehending mortality and morbility statistics, statistics of marriages and births, water supplies and water purification, sewerage and sewage purification, food and drug inspection, effect of feeding upon trichinosis in hogs, and other matters of great interest to the State and of practical importance to all sanitarians.

Of infectious diseases, the principal outbreak during the year was *small-pox*, which began in 1893 and reached its height in April, 1894, but had entirely subsided before midsummer. The principal data relative to the earlier period of this epidemic are detailed in the report of 1893, but during the closing period of the epidemic, comprising the first half of 1894, there were 185 cases reported. It appears that 201 cases, or nearly nine tenths of all that occurred in the two years, were reported in the seven months ending with June, 1894. In most of the previous epidemics of the past thirty years the height of the epidemic has come in midwinter. Then follows a table stating the number of small-pox cases which have been reported during the past ten years, and the number which have resulted fatally. As compared with the epidemic of 1872–73, and the still greater prevalence in prevaccination times, the recent outbreak is scarcely worthy of mention. But the collection of more careful records during the past ten years furnishes data for conclusions as to the effect of better methods of control. According to this table it appears that there have been 4548 deaths from small-pox in Massachusetts in the forty years ending with 1894. Of this total of 4548 deaths in the forty-year period, 4231 occurred in the first twenty years (1855–74) and 317 in the second twenty years (1875–94). The ratio in the first instance was 160 per 1,000,000 of the population annually, and in the second twenty years, 8 per 1,000,000. For the decade ending with 1894 the mortality from this cause was less than 4 per 1,000,000 annually.

*Typhoid-fever* mortality in Massachusetts has diminished with a comparatively uniform rate during the past thirty years or more, and the rapidity of its diminution may be taken as an index of progress in the introduction of public water supplies throughout the State. The old and accepted theory of its in-

timate connection with periods of deficient rainfall and of consequent low water in wells and streams does not appear to be borne out by the experience of Massachusetts, since the disease has prevailed with about the same frequency in years of deficient as well as of abundant rain, and some of the most severe epidemics have occurred in January and February, when rainfall was abundant. The general tendency, however, in a succession of years has been in a direction of a decrease in its frequency.

*Deaths* reported from each of 10 prominent causes during the year 1893 footed up as follows: Consumption, 5527; pneumonia, 5499; brain diseases, 5144; heart diseases, 3696; cholera infantum, 2704; old age, 1861; bronchitis, 1738; kidney diseases, 1685; cancer, 1533; diphtheria and croup, 1394. The facts in regard to consumption were treated more in detail than those which relate to other diseases for two reasons. First, it is the most prominent and destructive cause of death; second, a widespread interest in this disease has been created by the discussions relating to the prevalence of tuberculosis among cattle. It appears that there has been a progressive and quite uniform decrease in the death-rate from consumption in Massachusetts for nearly the whole period, the maximum and minimum death-rates being 42.7 per 10,000 of the population in 1853, and 22.7 in 1893, the last year of the period.

Deaths reported for 1894, from cities and towns with an estimated population of 1,466,000, 28,440—19.4 per 1000. Of children under five years of age, 10,258—36.1 per cent of total. Deaths from consumption, 3179—11.17 per cent of total from all causes.

*Marriages* registered in 1893, 22,814; *births* (exclusive of 2444 still-births), 67,192; *deaths*, 49,084. The birth-rate was 27.55 per 1000, and the death-rate 20.13. The marriage rate has declined during the period of registration; the highest marriage-rate being that of 1854, when it was 24.8 per 1000; and the minimum was in 1878, when it was 14.9. The mean rate for the five year period 1851–55 was 23.2, and that of the five-year period 1876–80 was 15.7. In the past ten years or more it has remained fairly uniform, the rate for the five-year period 1881–85 being 18.5 and that of 1886–90 being 18.6. For the three years 1891–93 it was 18.9.

*Of water supplies*, under the provisions of the act of 1886, the State Board of Health was given a general oversight over the inland waters of the State, and was required to examine these waters with reference to their use as sources of domestic water supply. The Board was also required to recommend measures to prevent the pollution of such waters, and was authorized to conduct experiments to determine the best practicable methods of purification of drainage and sewage or disposal of the same. The Board also gives advice to cities and towns, corporations and individuals, relative to the introduction of water supplies and systems of sewerage and sewage disposal; and the amount and character of the work performed by the Board under this act have justly won for their reports the reputation of being standard authority upon these subjects. In the present report of the Board, the topics presented in this connection are its advice to cities and towns, the examination of water supplies, the examination of rivers, summary of water-supply statistics and record of rainfall and flow of streams, the composition of the water of deep wells, the bacterial contents of ground waters and deep wells, experiments upon the filtration of sewage and of water and physical and chemical properties of sand—in all, 710 pages of most interesting and valuable matter.

A diphtheria antitoxin laboratory has been established; 6824 samples of food and drugs, including 3551 of milk, have been examined during the year; 53 applications for advice from cities and towns and others have been acted upon; 2006 samples of water have been examined chemically and microscopically, and 2534 of sewage and water chemically and bacterially; 6949 samples of sand have been examined in connection with sewage-disposal experiments.

Professor Marks's statistics with regard to the 449 hogs slaughtered at the Northampton Hospital in the last ten years indicate that the percentage infected with trichinæ has diminished from 25. to 0. and apparently from ceasing to give them any uncooked offal for food.

Professor Sedgwick, in his usual brilliant method, traces 40 cases of typhoid-fever apparently to the use of infected skimmed milk, in a report upon an epidemic in Marlborough. Forty-three pages of reports on Health of Towns indicate progressive improvement in local sanitation throughout the

State, especially regarding the intelligent control of diseases dangerous to the public health, the abating of nuisances, and co operation for gathering facts and extending information for the public good.

*Boston*, 494,205 : S. H. Durgin, M.D., Chairman. Report for November : 858 deaths, of which 241 were under five years of age. The annual death-rate was 20.83 per 1000. From *diphtheria* (and croup), 81 ; *typhoid-fever*, 13 ; consumption, 113. Cases of contagious diseases reported for the month : Diphtheria, 630 ; measles, 24 ; scarlatina, 120 ; typhoid-fever, 109.

MICHIGAN.—Hon. Frank Wells, President, Lansing ; Henry B. Baker, M.D., Secretary, Lansing.

The Secretary reports for the month of December, 1895, compared with the preceding month, erysipelas increased and typhoid-fever and scarlet-fever decreased in area of prevalence.

Compared with the average for corresponding months in the nine years 1886–94, typhoid-fever and scarlet-fever were more prevalent, and intermittent-fever, consumption, remittent-fever, inflammation of bowels, pneumonia, and bronchitis were less prevalent in December, 1895.

Including reports by regular observers and others, consumption was reported present in Michigan in the month of December, 1895, at one hundred and eighty-seven places ; typhoid-fever at ninety-seven places ; scarlet-fever at sixty-one places ; diphtheria at fifty-four places ; whooping-cough at eighteen places ; measles at seventeen places, and small-pox at three places.

Reports from all sources show consumption reported at one place less ; typhoid-fever at forty-five places less ; scarlet-fever at three places less ; diphtheria at seventeen places less ; whooping-cough at two places more, and measles at seven places more, in the month of December, 1895, than in the preceding month. Small-pox was reported present at the same number of places.

The Secretary finds it difficult (Lansing *Journal*, January 11th) to carry out the purpose of the State Board because the boards of health of Lansing and Detroit refuse to incur the trouble and trivial expense of making the needful reports required with regard to the prevention of consumption. At

the quarterly meeting of the State Board (January 10th) the Secretary read a letter from Health Officer Duffield, of Detroit, in which that officer refused to make his annual reports to the State Board of Health in accordance with the law. As the law requiring these annual reports from health officers is specific, the Board directed that in case of any neglect or refusal of any health officer, clerk, or other officer in Michigan to make the reports requested by the State Board of Health and required by law, the Secretary is authorized and directed to take all the necessary steps to secure such reports from any such officer.

*Detroit*, 250,000: S. P. Duffield, M.D., Health Officer, reports for December: Deaths, 298, of which 58 were under five years of age. Annual death-rate per 1000, 12.50. Deaths from *diphtheria* (and croup), 26; *typhoid-fever*, 3; consumption, 26. Cases of diphtheria reported, 119; scarlet-fever, 27; typhoid-fever, 3; small-pox, 2.

MINNESOTA.—Franklin Staples, M.D., President, Winona; C. N. Hewitt, M.D., Secretary, Red Wing.

*St. Paul*, 140,292: Alexander J. Stone, M.D., Commissioner, reports for December: Deaths, 133; under five years of age, 55. Annual death-rate per 1000 was 11.37. Deaths from *diphtheria*, 17; *typhoid-fever*, 2; consumption, 14.

*Minneapolis*, 225,602: H. N. Avery, M.D., Health Commissioner, reports for November: Deaths, 180; under five years of age, 70. Deaths from *diphtheria* (and croup), 22; *typhoid-fever*, 13; *measles*, 10; consumption, 24. Deaths for the year ending November 30th, 2131; death-rate, 9.44.

*Duluth* appears to have indulged one of the severest epidemics of *typhoid-fever* on record. The *Court Herald*, Saginaw, Mich., of January 5th, reports that there have been not less than 2500 cases, all occasioned by impure drinking water. "Health Officer" Routh says (*Commonwealth*, Duluth, January 2d) the reports are greatly exaggerated. "Last month there were 250 cases, and thus far this month 100 new cases have been reported. Most of last month's cases have convalesced. In November of last year there were 200 cases of typhoid, so-called, and during the entire year 665 cases, of which 74 terminated fatally." The exaggeration is evidently

not of the criminal mortality, but of the tolerance of the authorities responsible for it.

*Diphtheria* is reported to be prevalent in *Albany* and Hay Creek.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Willis P. King, M.D., Secretary, St. Louis.

At a session of the State Board for dealing with the question of law in regard to the status of certain medical colleges, January 6th, Dr. Willis P. King, of Kansas City, who is Secretary of the Board of Health, submitted the following letter from a graduate of a St. Louis medical college who was an applicant for a certificate of competency:

"DEER DOCTOR: Plese informe me when and wher the Stat Bord of Helth meats."

The Board has absolute power in all matters relating to the practice of medicine in the State, and if a college is declared not to be in good standing, the diploma issued by it is void.

*St. Louis*, 560,000: M. C. Starkloff, M.D., Commissioner of Health. Official report for December: Deaths, 778; under five years of age, 253; from *diphtheria* (and croup), 74; *typhoid-fever*, 7; phthisis, 91. Annual death-rate per 1000, 16.67.

*Kansas City*, 150,000: R. P. Waring, M.D., Health Officer, reports for December: Deaths, 166; under five years of age, 53. Annual death-rate per 1000 was 13.28. Deaths from *diphtheria*, 6; *typhoid-fever*, 4; consumption, 4.

NEBRASKA.—J. V. Beghtol, M.D., President, Friend; F. D. Haldeman, M.D., Secretary, Ord.

*Omaha*, 140,452: Official report for November: Deaths, 65; from *diphtheria*, 8, of 26 cases reported; *typhoid-fever*, 2, of 4 cases reported. Diphtheria continues prevalent. Death-rate, 5.6.

*Diphtheria* is raging to such an extent at *Gilman* that the public schools have been closed.

NEW HAMPSHIRE.—G. P. Conn, M.D., President, Concord; Irving A. Watson, M.D., Secretary, Concord.

*Manchester.*—Annual report of the Health Officer for 1895 (*Mirror*, January 11th): *Diphtheria*, 35 cases, 8 deaths; scarlet-fever, 44 cases, 8 deaths; *typhoid-fever*, 21 cases, 3 deaths;

measles, 158 cases, no deaths. In addition to this there were 24 cases of *typhoid-fever* at the Margaret Pillsbury Hospital, 2 of which were fatal, not included in the above.

*Concord*, 19,000: Health officers report for December (*Patriot*, January 7th): Deaths, 34; death-rate, 13.8. During the month 2 cases of *typhoid-fever*, 1 of scarlet-fever, and 1 of *diphtheria* were reported. For the year 1895: Deaths, 372; death-rate, 15.33.

NEW JERSEY.—C. F. Brackett, M.D., President, Princeton; Henry Mitchell, M.D., Secretary, Asbury Park.

*Hudson County—Jersey City* and vicinity—318,746: Official report for November: Deaths, 424; under five years of age, 265; from *diphtheria*, 32; from *typhoid-fever*, 10; from consumption, 57. Annual death-rate per 1000, 18.9.

*Newark*, 215,725: Health Officer Lehlbach's report for the *week* ending January 4th (*Call*): *Diphtheria* is making headway in the city; 65 new cases against 49 of the previous week, and 15 deaths. From typhoid-fever 2 deaths. Total number of deaths registered, 96—16 more than for previous week. Annual death-rate, 23.11.

*Hoboken.*—Report of Health Inspector Granelli (*News*, January 10th) for December: Eighty-nine cases of contagious disease, of which 53 were *diphtheria*, 7 croup, 26 scarlet-fever, 2 of measles, and 1 of typhoid-fever. There were 103 deaths against 102 for December of 1894.

*Oranges.*—Health Officer reports (*Journal*, January 4th). Since November 25th there have been 40 cases of *diphtheria*, with 6 deaths; and there are at the present time 11 cases of that disease and 1 of *typhoid-fever*.

*Salem*, December 26th.—Owing to the prevalence of *diphtheria* in this city, the public schools have been closed for two weeks to allow a thorough cleansing and disinfecting of all the buildings.

*Bayonne* (*Journal*, Jersey City, January 9th).—Health Inspector S. V. Morris reports for the month of December: Cases of scarlet-fever, 21; *diphtheria*, 19; membranous croup, 2.

NEW YORK.—Daniel Lewis, M.D., President, Syracuse; B. T. Smelzer, M.D., Secretary, Albany.

The Secretary's *Bulletin* for November gives 280 deaths,

the average number daily for the month for the past ten years, that of the preceding ten months of 1895 having been 340. There were 200 more deaths than in November, 1894. Annual death-rate per 1000 population. 15.50. The infant mortality (under five years of age) was 27.4 per cent, which is the same as that of the corresponding period for the last two years, that of October having been 31.5. The zymotic mortality has decreased from 16.7 per cent of the total deaths to 13.5, and is below the average for this month. Compared with last November the deaths from *diphtheria* are much less, being 5.8 per cent of the total against 8.5 ; there has been a smaller increase than usual since October. From other zymotic diseases the mortality is almost identical with that of a year ago, except from measles, which shows a marked increase, and to a less degree from *typhoid-fever* and malarial diseases. There were 96 deaths from measles, which is double the number reported in October ; it has been especially prevalent in New York, Brooklyn, and Albany, in which 74 of the deaths occurred. From typhoid-fever there were in the five cities of over 100,000 population 2.4 deaths per 100,000 population ; in the rest of the State there were 4.0. From diphtheria, there were 9.0 deaths per 100,000 population in these large cities ; in the rest of the State there were 5.0. There were 17.2 deaths per 100,000 population in the large cities from consumption, against 12.0 in the rest of the State. June and November have fewer deaths from this cause than other months of the year. Deaths from acute respiratory diseases are nearly double the number occurring in October, though not above the average for this month. The temperature was above the normal, the percentage of humidity being high, as also the dew point, the rainfall being a little above the average, with southerly and westerly winds of moderate velocity.

*New York*, 1,995,000 : Total deaths for November, 2935—989 under five years. Death-rate, 18.80. Zymotic diseases, per 1000 from all causes, 118.57 ; from *diphtheria* (and croup), 195 ; *typhoid-fever*, 37. Deaths from consumption, 412.

December 31st.—Sanitary Superintendent Roberts submitted his annual report for the year 1895. The number of inspections and reinspections made by the sanitary inspectors was 84,870, and by the sanitary police, 280,809. This shows

a marked increase over the work performed last year. The entire work of the department has been greatly increased, and there has also been an increase in the number of orders issued by the Board, which aggregate more than 32,000 as against about 20,000 issued last year. The orders of the Board have been much more promptly complied with than in former years. This is due to the prompt action taken in the attorney's office, and also to the fact that the Board, in conformity with the provision of Section 659 of the Consolidation Act, where the conditions were such as to require it, ordered the premises vacated. This was done in 626 cases. The premises have not been actually vacated, but this action by the Board increased the activity of the owners to that extent that the orders were at once complied with. In about 104 cases, however, it was necessary to actually vacate the houses before the orders of the Board were complied with.

The lodging-houses of the city, 107 in number, which require a permit from the Board of Health, owing to the strict surveillance observed by the inspectors of the Board, are in a very good condition.

In the division of food inspections and offensive trades, the number of investigations in regard to the character of the milk have been very much increased, the number of analyses being 3106; the number of arrests made was 695, against 159 for the entire year of 1894; and the amount of fines collected was $12,802, as against $2708 last year. The total number of pounds of fruit, meat, and fish seized and condemned was 6,766,432.

Dr. Tracey, Register of Vital Statistics, reported as follows:

Estimated population, July 1st, 1894, 1,809.353; July 1st, 1895, 1,879,195. Cause of death: Influenza, 566; small-pox, 10; measles, 766; scarlet-fever, 465; diphtheria, 1628; whooping-cough, 495; typhoid-fever, 321; malarial-fever, 90; cerebro-spinal meningitis, 203; diarrhœal disease, 3208 (of which 2839 were in cases of children); heart diseases, 2286; croup, 342; bronchitis, 1616; pneumonia, 5707; phthisis, 5182; Bright's disease and nephritis, 2681; sunstroke, 85; accident, 2036; homicide, 76; suicide, 375; all other causes, 15,281; total, 43,419; death-rate, 23.15; deaths under one year, 11,120; deaths under five years, 18,100; over sixty-five

years, 4571 ; in institutions, 10,306 ; in tenement-houses, 27,435 ; total marriages, 20,612 ; births, 53,731 ; still-births, 3372.

*Brooklyn*, 1,100,000 : Total deaths for November, 1503—490 under five years. Death-rate, 16.80. Zymotic diseases per 1000 from all causes, 155.35 deaths ; from *diphtheria* (and croup), 136 ; from typhoid-fever, 17 ; from consumption, 159.

Health Commissioner Emery's report to the Mayor for eleven months ending November 30th : 20,558 deaths, 18,144 births, and 6040 marriages. The estimated population is 1,100,000, and the consequent ratio of mortality 20.5 per 1000. He assures the Mayor that Brooklyn has been without an epidemic disease for the past year. Diphtheria caused some trouble, but the Commissioner and his subordinates prevented its undue spread and reduced the mortality. Notwithstanding the absence of an epidemic disease, this is a slight increase on the year before.—Dr. Emery notes that the cases of diphtheria in the period covered by his report numbered 3569, or 200 more than in the same period in 1894. He says that more cases have been reported by physicians because the department gives free of cost the advantage of an accurate diagnosis by means of the bureau for bacterial examination.

He points to an improved method of disinfecting by means of the steam disinfecting plant, and says that " *dry* steam, at a sufficient temperature and for a time long enough to destroy the bacillus, is the latest remedy." With regard to the infectious character of consumption, he believes that there are in Brooklyn many houses that have become infected from the presence of former consumptives, and advises a renovation of their sanitary condition.

The Commissioner calls attention to the growth of glanders in horses, and suggests the abolition of the old drinking troughs as incentives to infection. The use of the Mallein test is recommended, as glanders may exist for months in a horse without the owner's knowledge.

Regarding the right of the Health Department to quarantine for small-pox, he says :

" The controversy has centred on the power of the department to isolate persons exposed to contagion or infection. While the courts of original and appellate jurisdiction have all affirmed, not only the power, but the duty of the department

to isolate persons so exposed, yet they have ruled that in so doing the Commissioner of Health acts at his peril, and if the person isolated has not, in fact, been exposed, the Commissioner has exceeded his authority. . . . It is difficult to perceive how, in case of epidemic, the health of a large city, densely populated, can be adequately protected under the narrow margin of powers in the Health Officer established by these rulings; and it is confidently believed that the courts will materially modify and enlarge the view now entertained by them of this vitally important subject."

For the four weeks ending December 28th, cases of diphtheria and "croup" reported, 652, with 182 deaths. For the two weeks ending January 11th, cases reported, 228, with 91 deaths.

*Syracuse*, 95,000: Total deaths for November, 110—26 under five years of age. Death-rate, 13.15. Zymotic diseases per 1000 deaths from all causes, 110.10; from consumption, 12.

*Albany*, 100,000: Total deaths for November, 193—61 under five years. Death-rate, 22.65. Zymotic diseases per 1000 deaths from all causes, 354; from *diphtheria*, 7; *typhoid-fever*, 13; from consumption, 26.

Report for the year 1895: Deaths, 2342; under five years of age, 682. Death-rate (98,900), 23.89. The principal causes of death were: Consumption, 287; disease of nervous system, 319; acute respiratory, 306; diarrhœa, 345; typhoid, 162; digestive system diseases, 146; urinary system disease, 153; circulatory system diseases, 176; accidents and violence, 82; cancers, 71; measles, 66; croup and diphtheria, 51; old age, 60.

*Buffalo*, 335,709: Total deaths for November, 346—116 under five years. Death-rate, 12.37. Zymotic diseases per 1000 deaths from all causes, 200; from *diphtheria* (and croup), 42; *typhoid-fever*, 13; consumption, 55.

*Rochester*, 150,000: Total deaths for November, 176—53 under five years. Death-rate, 13.20. Zymotic diseases per 1000 deaths from all causes, 200; from *diphtheria* (and croup), 42; *typhoid-fever*, 13; consumption, 33.

NORTH CAROLINA.—H. T. Bahnson, M.D., President, Salem; Richard H. Lewis, M.D., Secretary, Raleigh.

Official *Bulletin* of the State Board of Health for November: 81 counties aggregating 90,822 white, 64,763 colored: 155,585 population. Deaths: 95 white, 88 colored: 183. Death-rates: 12.6 white, 16.3 colored: 14.1. Under five years of age: 21 white, 30 colored: 51. Death from prevailing diseases: typhoid-fever, 12; pneumonia, 15; consumption, 42—20 white, 22 colored; diarrhœal diseases, 18.

OHIO.—Byron Stanton, M.D., President, Cincinnati; C. O. Probst, M.D., Secretary, Columbus.

*Cincinnati*, 336,000: J. W. Prendergast, M.D., Health Officer, reports for December: Deaths, 560. Death-rate, 20.00 per 1000. Under five years of age, 179. From *diphtheria* (and croup), 29; *typhoid-fever*, 23; consumption, 68.

*Cleveland*, 262,000: J. L. Hess, M.D., Health Officer. Deaths from *diphtheria* (and croup) in October, 56; *typhoid-fever*, 17; consumption, 46. Total from all causes, 451. Death-rate, 16.34. Much typhoid-fever in the city (*Press*, January 7th). The water is particularly bad, and the officials of the Health Department believe that much of it is caused by deleterious matter in the lake water.

*Toledo*, 120,000: J. T. Woods, M.D., Health Officer, reports for December: Deaths, 120; under five years of age, 16. Death-rate per 1000, 12.9. *Diphtheria* (and croup), 8; *typhoid-fever*, 5; consumption, 13.

*Small-pox* continues to give the State Board a good deal of trouble.

*Martin's Ferry* (Pittsburg *Times*, January 10th) has had a total of 61 cases of small-pox and varioloid and 6 deaths. Eight families have been discharged this week. Bridgeport has had 47 cases and 5 deaths, and 6 cases are now quarantined. Martin's Ferry's small-pox bills for the past month exceed $2000, and Bridgeport's are more in proportion to the population. St. Clairsville has paid out $549 for guards.

The State Board held a meeting at Bellaire, January 9th, at which 50 delegates were in attendance. It was the unanimous opinion that towns along the valley should not raise the quarantine. There are 74 cases in the infected district, and 24 convalescents. The Steubenville and East Liverpool boards

of health were advised to mainain the quarantine against Martin's Ferry.

PENNSYLVANIA.—S. T. Davis, M.D., President, Lancaster; Benjamin Lee, M.D., Secretary, Philadelphia.

*Philadelphia*, 1,163,864: Theodore B. Stubb, Health Officer, reports: In the four weeks ending December 28th, deaths, 1729—598 under five years of age. Deaths from *diphtheria* (and croup), 143; *typhoid-fever*, 30; from consumption, 187.

Philadelphia had over 4500 cases of *typhoid-fever* last year. The average cost of each case for physicians, medicine, and nursing, Dr. Leffmann puts at $100, or a total of $450,000. This represents the direct money cost of typhoid-fever—a disease which is the legitimate fruit of impure water. This outlay caused by typhoid cases is 3 per cent on $15,000,000, which would more than suffice to filter all the water furnished to the city and deliver it to the people free from typhoid germs.

*Pittsburgh*, 275,000: J. Guy McCandless, M.D., Registrar, reports for four weeks ending January 4th: Deaths, 434—167 under five years of age. Deaths from *diphtheria* (and croup), 18; from *typhoid-fever*, 21.

*Diphtheria* is reported prevalent in *Pottsville*, *Girardville*, *Salem*, *William Penn*, and *Lost Creek*.

RHODE ISLAND.—A. G. Sprague, M.D., President, River Point; Gardner T. Swarts, M.D., Secretary, Providence.

*Bulletin* of the State Board for November shows the number of cases of infectious diseases reported as follows: *Diphtheria*, 222; *typhoid-fever*, 116; *scarlatina*, 84. Typhoid-fever has been mostly confined to Providence, 22 cases; Newport and Warwick, each 6; none of the other towns more than 3. Diphtheria: Central Falls, 41; Johnston, 40; Providence, 37; Pawtucket, 32; Cumberland, 31; Cranston, 17; Woonsocket, 12; Lincoln, 4; seven other towns, one to two each, 9. Cumberland, Central Falls, and Pawtucket, where diphtheria epidemics of more or less virulence are raging, all show an increase.

SOUTH CAROLINA.—J. R. Bratton, M.D., Chairman, Yorkville; H. D. Fraser, M.D., Secretary, Charleston.

Report of the State Board to the Legislature (Charleston

*News*, January 11th) urges the appropriation of $1000 instead of $500 as heretofore, in aid of its work of diffusing information promotive of the public health, and the passage of an act to enforce vaccination throughout the schools of the State.

*Charleston*, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M.D., Health Officer, reports for four weeks ending December 28th: Deaths, 115—66 colored. Under five years, 34; deaths from consumption, 16. Annual death-rates, white, 22.6; colored, 23.67: 26.60 per 1000.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville; J. Berrien Lindsley, M.D., Secretary, Nashville.

*Bulletin* for December not received.

At the regular quarterly meeting of the Board (Nashville *Banner*), January 7th, the Secretary submitted a summary of *small-pox* in the southwestern corner of the State as compared with the outbreaks of the disease at various times in Tennessee and in other States.

From June to December, inclusive, the total cases from the County of Shelby, outside the Memphis city limits, was 89; of these 20 were white, 9 male and 11 female; of the colored, 39 male and 30 female. The cases occurred at twenty-nine different points in Mississippi and Arkansas, and these cases became foci for spreading the disease before they were discovered and removed to the hospital. Within the city limits, from March 23d to December 31st, 73 cases occurred, of which 21 were easily traced to points outside of Tennessee and 18 known to have been infected by these, making 39 clearly from the outside; and most of the others were probably from them. Thirty-two separate points were infected; only 9 second cases in these points. Of the 73, only 5 were white. The refuge for all the cases from county and city is the County Hospital, fully described in the December *Bulletin*. Thus, its inmates for the entire year were 162. The number of deaths reported by Dr. McKay, the resident physician, for the year is 39, being, adults, white, 5; adults, colored, 30; children, all colored, 4. The large colored population in the three States of which Memphis is the commercial centre constitutes the menace to that important city."

*Memphis*, 55,923—white, 28,064; colored, 27,859: J. J. McGowan, M.D., Secretary of the Board of Health, reports for December: Total deaths for the month, 109—white, 55; colored, 54. For the same month in 1894, 105—white, 46; colored, 59. Annual rate per 1000 during the month, includ-

ing non-residents—white, 23.52 ; colored, 23.26 ; total, 23.39. Annual rate per 1000 during the month, residents only—white, 16.60 ; colored, 19.42 ; total, 18.07. Deaths from *diphtheria*, 2 ; *typhoid fever*, 2 ; consumption, 18.

Singularly, there is no mention of *small-pox*. The Memphis *Scimeter*, January 9th, says that the report shows that there were "35 cases of *small-pox*, all sent to the small-pox hospital. There were 7747 vaccinated during the month." Important items certainly, though *not* deaths.

At a conference of health and civic officers, held at Memphis, January 4th, with reference to efficient restrictive measures for the prevention of small-pox, a resolution was adopted to appoint a committee to urge upon the governors of Arkansas and Mississippi to establish boards of health, on plans to be suggested by the committee or otherwise.

The committee was made to consist of Dr. H. C. Dunnavant, Secretary State Board of Health, Arkansas ; Dr. J. Beren Lindsley, Secretary State Board of Tennessee ; Judge B. Barton, County Judge of Crittenden County ; Dr. G. B. Thornton, President Board of Health of Memphis ; Dr. M. Vaughn, President Board of Health of Little Rock ; Dr. J. R. Sanford, Covington ; Dr. F. S. Raymond, President Shelby County Board of Health ; Dr. S. J. Knott, Crawfordsville, Ark.

UTAH.—*Salt Lake City*, 48,076 : William T. Dalby, M.D., Commissioner, reports for December : Deaths, 38—11 under five years of age. Deaths from *scarlet-fever*, 6 ; *typhoid-fever*, 1. Annual death-rate, 6.71 per 1000.

VIRGINIA.—R. W. Martin, M.D., President, Chatham ; A. Irving, M.D., Secretary, Richmond.

A bill has been introduced in the Legislature in relation to the powers, duties, etc., of the State Board of Health, and providing for an appropriation of $5000 to carry out the purposes of the bill. The bill proposes to confer important powers on the Board in respect to taking effective measures to promote the public health and prevent the spread of contagious or infectious diseases.

WASHINGTON.—*Spokane*, 30,000 : Health Officer Wallace W. Potter reports (*Review*), January 9th, for quarter ending December 31st : Deaths, 51 ; annual death-rate, 6.80. The

only cases of contagious disease reported during the quarter were 18 of scarlet-fever, none of which were fatal.

WISCONSIN.—Solon Marks, M.D., President, Milwaukee; U. O. B. Wingate, M.D., Secretary, Milwaukee.

At a meeting of the Board at Milwaukee, December 9th, the Secretary reported that the number of cases of typhoid-fever reported to the Board since July 1st throughout the State was 625, of which 133 were reported in Milwaukee, 115 in Superior, 74 in Shell Lake, 52 in Ashland, and 24 in La Crosse. The causes of the prevalence of the fever were invariably due to the use of contaminated water.

*Milwaukee*, 250,000: H. E. Bradley, M.D., Commissioner, reports for December: Deaths, 276—67 under five years of age. Annual death-rate, 13.25 per 1000. Deaths from *diphtheria* (and croup), 26; *typhoid-fever*, 13; from consumption, 27. *Cases* of diphtheria reported, 58; typhoid-fever, 23; scarlet-fever, 16.

CANADA.—At the quarterly meeting of the Provincial Board of Health of Quebec, at Montreal, January 9th (Montreal *Witness*, January 13th), Dr. E. Pelletier, Secretary, reported: Deaths in the province, due to *diphtheria*, *scarlet-fever*, and *typhoid*, during November and December, was submitted:

November, 1895.—Diphtheria, 204; scarlet-fever, 7; typhoid-fever, 24. Total deaths, 235.

December, 1895.—Diphtheria, 143; scarlet-fever, 15; typhoid-fever, 13. Total deaths, 171.

*Quebec* (*Chronicle*, January 6th).—Report of the municipal Board of Health for 1895 shows a total of 335 cases of contagious diseases and 65 deaths therefrom. Of these, *diphtheria* is credited with 131 cases and 31 deaths; croup with 27 cases and 17 deaths; *scarlet-fever* with 115 cases and 11 deaths; *measles* with 3 cases and no deaths; and *typhoid-fever* with 59 cases and deaths.

*Ottawa.*—Dr. Robillard reports (*Journal*, January 10th): Ottawa's death-rate for the year ending November 30th was 20.82 per 1000 population—considerably lower than the previous year, which was 21.66. The total number of deaths was 1083. From consumption, 83; *diphtheria*, 80; pneumonia, 73; typhoid and scarlet-fever "are account"?

BUENOS AYRES, 616,764.—Official report for October: *Deaths*, 1421; under five years of age, 758; deaths from *diphtheria*, 38; *typhoid-fever*, 52; *small-pox*, 41; *consumption*, 96. Births, 2292. Population, October 31st, 618,685.

## CONTEMPORARY LITERATURE.

### THE PNEUMOGASTRIC NERVE.

UPON an average, twice a week,
When anguish clouds my brow,
My good physician friend I seek
To know "what ails me now."
He taps me on the back and chest,
And scans my tongue for bile,
And lays an ear against my breast
And listens there awhile;
Then is he ready to admit
That all he can observe
Is something wrong inside, to wit:
My pneumogastric nerve!

Now, when these Latin names within
Dyspeptic hulks like mine
Go wrong, a fellow should begin
To draw what's called the line.
It seems, however, that this same,
Which in my hulk abounds,
Is not, despite its awful name,
So fatal as it sounds;
Yet of all torments known to me,
I'll say without reserve,
There is no torment like to thee,
Thou pneumogastric nerve!

This subtle, envious nerve appears
To be a patient foe,
It waited nearly forty years
Its chance to lay me low;
Then, like some blithering blast of hell,
It struck this guileless bard,
And in that evil hour I fell
Prodigious far and hard.

Alas! what things I dearly love—
Pies, puddings, and preserves—
Are sure to rouse the vengeance of
All pneumogastric nerves!

O that I could remodel man!
I'd end these cruel pains
By hitting on a different plan
From that which now obtains.
The stomach, greatly amplified,
Anon should occupy
The all of that domain inside
Where heart and lungs now lie.
But, first of all, I should depose
That diabolic curve
And author of my thousand woes,
The pneumogastric nerve.

—EUGENE FIELD. *From the Christian Advocate.*

"IN WASHINGTON'S DAY."—The January number of *Harper's Magazine* contains the first instalment of a new biography of Washington by Professor Woodrow Wilson, of Princeton University. The opening paper is sumptuously illustrated from old portraits and from drawings by Howard Pyle. It is concerned chiefly with the condition of the colonies, and more particularly with the condition of Virginia, at the time of Washington's birth. Professor Wilson has the historian's sense of perspective, but he approaches his subject with a charm of style usually thought to belong to a lighter literature. The beginning certainly promises a life of Washington done in the manner of which Thackeray gives us a glimpse in his novel "The Virginians."

THE JEWS OF NEW YORK.—It is more than two hundred and forty years since the Jews were first admitted, by special license, as it were, to the New Netherlands, on the express condition that "the poor among them should not become a burden to the company or to the community, but be supported by their own nation," and most loyally have they kept the compact that long since ceased to have force to bind. Their poor are not, and never were, a burden upon the community. The Jewish inmates of the workhouse and the almshouse can

be counted on the fingers of one hand any day. They are not paupers. Of the thousands who received help through the dreadful winter of two years ago, scarce a half dozen remained to be aided when work was again to be had for wages. The Jewish charities are supported with a generosity and managed with a success which Christians have good cause to envy. They are not run by boards of directors who stretch their legs under the table in the board room while they leave the actual management of affairs to paid superintendents and officials. The Jew as a charity director directs, and he brings to the management of his trust the same qualities of business sagacity, of unerring judgment and practical common sense with which he runs his store on Broadway. Naturally the result is the same.—*From "The Jews of New York," by* JACOB A. RIIS, *in the January Review of Reviews.*

Herr Ahlwardt's anti-Jewish campaign receives no encouragement in this article. The best answer to Herr Ahlwardt's attacks is a fair showing, such as Mr. Riis gives, of what the Jews in our community are doing to better their own conditions in life. Such work as that of the Hebrew Institute, described by Mr. Riis, should be better known to the Gentile population. Mr. Riis also commends the efficient organization of the Jewish charities in New York.

THE INDEX MEDICUS, THE ANNUAL OF THE UNIVERSAL MEDICAL SCIENCES, AND MR. GEORGE S. DAVIS.—The medical profession is to be congratulated upon the fact that a sufficient number of subscribers at $25 a year has been obtained to continue the *Index Medicus.*

Almost the first, if not the first, physician to offer to subscribe $25 a year for the continuance of the *Index*, was Dr. Charles E. Sajous, the editor-in-chief of the *Annual of the Universal Medical Sciences*, who wrote a letter from his office in Paris making this offer and urging the profession to join with him in resuscitating the *Index*. We learn, much to our regret, that some unprincipled book canvassers have attempted to circulate the report that the *Annual of the Universal Medical Sciences* is in danger of discontinuance, and that Dr. Sajous has been writing letters in a frantic endeavor to keep it on its feet. On the contrary, the *Annual of the Universal Medical Sciences*, which is an invaluable publication, is more

appreciated, and therefore in better shape financially and otherwise, than ever before.

It is interesting to note in this connection that on November 30th a dinner was given in Philadelphia to Dr. John S. Billings, one of the editors of the *Index Medicus* and the compiler of the Index Catalogue of the Library of the Surgeon-General's Office, by a large number of prominent medical men from various points throughout the United States, who had subscribed to a purse of $10,000 as an evidence of their appreciation of Dr. Billings's self-sacrificing efforts in the cause of medical literature. After the check had been presented to Dr. Billings in presentation speeches by Dr. S. Weir Mitchell and Dr. Da Costa, several of the other guests of the evening were called upon to make remarks, and in the course of the speech of Dr. Fletcher, who has been a co-laborer with Dr. Billings ever since the War, this gentleman took the opportunity of congratulating those present upon the fact that the *Index Medicus* is to be continued, and in the course of a brief history of its publication emphasized the fact that through the generosity of its present publisher, Mr. George S. Davis, the *Index Medicus* had been maintained for years after the cost of its publication far exceeded the amounts received from subscriptions.

In consideration, too, of the efforts made by Mr. Davis in the past and present for the maintenance of this valuable work of reference, the Société Français d'Hygiène of Paris has elected Mr. Davis a Foreign Associate Member, thus emphasizing the recognition of his services to medical literature. —*Therapeutic Gazette.*

SCIENTIFIC TEMPERANCE.—The primary purpose of science teaching is to give not virtue but strength. The strong mind forms its own precepts of right action. The weak mind fails, whatever its memorized precepts. The methods favored by the advocates of scientific temperance must always fail of their purpose. No impulse to virtue is less effective than memorized statements of the evils of vice. Information learned by heart is never vital, least of all that which is given on doubtful authority, by methods not sanctioned by pedagogic experience. If such educational methods really led to temperance we might overlook their less desirable results. But the youth

cannot be made virtuous by sentimental gush nor by scientific bugaboos. Just in proportion to his ignorance of the subject will be the teacher's willingness to undertake the teaching proposed by the New York law. Hence arise the penalties laid on teachers and trustees, a thing unheard of in relation to any study that justifies itself.

It is evident that the value of the study of physiology is weakened or destroyed by neglecting its scientific aspects and by throwing its conclusions out of perspective. We might as well ask that our histories of the United States should devote a fifth of each chapter to the effect of the spoils system on the events described. The spoils system is to our politics what alcohol is to our bodies, and a wonderful field would be open to reformers if their doctrines could be forced into all historical text-books. And if one class of reformers is admitted, there would be room for many others.—DAVID STARR JORDAN, *in Appletons' Popular Science Monthly for January.*

"FOREIGN MISSIONS IN THE LIGHT OF FACT" are ably and authoritatively discussed in the *North American Review* for January by the Rev. Dr. Judson Smith, Foreign Secretary of the American Board of Commissioners of Foreign Missions. Dr. Smith places in a strong light the work now going on abroad in the principal missionary fields of to-day, and shows why the cause of foreign missions should incite the Church of our times to carry on and complete the spread of Christianity.

ABNORMAL PLEASURES AND PAINS are the subject of an article by Professor Th. Ribot (January *Monist*), who applies to their explanation the pathological method, using disease as a means of analysis. His results as regards the pleasure which some people take in pain are highly interesting.

A JOLLY AND EXHILARATING WINTER SPORT.—Of what endless merriment have these small coasting runs at St. Moritz been the scene? Bets have there been decided upon rocking-horses; there clipper-sleds and double-rippers, pigstickers and bob-sleighs, fearful wildfowl of all sorts and kinds may be descried of a fine afternoon sliding round "Caspar's Corner" toward the shores of the frozen lake. There is a perpetual swing and flash of movement and bright color; a ring of

laughter in the frosty air; while the warning cry of "*Achtung*" echoes from every corner, as the rattling sleds go by, and more keep coming upward from below to start again.—*From "A New Sport," in the January Scribner's.*

BREAKFAST IN THE OLD DAYS.—In old days a hungry man could get more things to eat at a New England breakfast-table than are to-day served at many a banquet. Hungry men have declined in numbers and influence, and European travel has had a depleting effect upon that fine old institution—breakfast. No one but the "Autocrat" ever talked much at that meal, for the viands were too tempting—great beef-steaks, hot rolls, buckwheat cakes, omelettes, potatoes, coffee, and even, at Mr. Emerson's, pie. Then returned travellers began to bring back tales of the refined Continental breakfast of coffee and a roll. It was even narrated that an Italian gentleman thought that he had eaten a very hearty breakfast when he put cream in his coffee.

So pie was first banished, and the other heavy articles gradually followed it into exile, and breakfast is shorn of its glories. Those who aim at a restoration of the vigor of the Puritans should begin by restoring "pie" to its former high estate, and the "Continental breakfast" should be banished from a hemisphere where the Monroe doctrine and the pie should reign supreme.—*Harper's Weekly.*

## ANNOUNCEMENTS.

CENSUS OF HORSES AND STABLES IN BROOKLYN.—We are gratified to announce that the police have completed a census of the horses and stables in this city.

According to the returns transmitted to the Health Office there are 7948 stables, public and private, in Brooklyn, and 31,580 horses.

There are 11,626 horse-owners. The locations of the stables and the names of the owners will be made a matter of record in the Health Department, and will form the basis of a system of inspection to be made hereafter by Health Office veterinarians.

THE REAPPOINTMENT OF DR. Z. TAYLOR EMERY, Commissioner of Health of Brooklyn, is a merited tribute to his success in stamping out small-pox in 1894, despite the contention of hungry lawyers with ignorant clients, and an encouragement to him to make a like vigorous effort to stamp out diphtheria, which will doubtless incur the opposition of the owners and keepers of filthy stables, filthy bakeries, sidewalk grocers and marketmen.

SCHOOLHOUSE SANITATION IN BOSTON.—Mayor Quincy has appointed Professor Francis W. Chandler, of the Institute of Technology, Frederic Tudor, an expert in sanitation, and Professor S. Homer Woodbridge, also of "Tech.," as an expert committee to examine into the present condition of the schoolhouses in respect to ventilation and sanitation.

THE WORLD'S CONGRESS OF MEDICO-CLIMATOLOGY will hold a national convention in San Antonio, Tex., February 20th, 21st, and 22d, 1896. Papers will be read by many of those in attendance, and the proceedings of the Congress will be very interesting and instructive. All physicians in good standing are invited to attend. Membership fee is only $5 for five years, payable in advance. Nearly seven hundred representatives have been appointed by the various State societies to date. Printed copy of Constitution and By-Laws will be sent upon application, with other matter relating to the Congress.

W. S. ROWLEY, M.D.,
*Cor. Secretary.*

MENGER HOTEL, SAN ANTONIO, TEX.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION will hold its next annual meeting in Lakewood, N. J., in May, 1896. The President of the Association is Dr. James B. Walker, and the Secretary Dr. Guy Hinsdale, both of Philadelphia.

"NATIONAL SANITARY ASSOCIATION."—A new organization under this name is reported as having been formed at Atlanta, Ga., October 24th, 1895. The announced object is to secure uniform regulations for the quarantining of contagious diseases; the adoption of the most improved methods of disposing of night soil and garbage in all cities, and in a general

way to disseminate among the men engaged in sanitary work statistics and such information as will aid them in the performance of their duties.

Officers elected: President; Dr. Wallace Sibley, Rochester; Vice-President, Dr. F. O. Young, Lexington, Ky.; Secretary, Thomas E. Veal, Atlanta; Treasurer, Carlton E. Hoadley, New Haven.

HYGIENIC EXPOSITION OF WARSAW.—Consul Rawicz has written to the Department of State, from Warsaw, that:

The second Hygienic Exposition of Warsaw will be held in the city of Warsaw, Poland, during the year 1896. The exposition will be opened on May 15th, and will close on July 15th. The first hygienic exposition in Poland was in the year 1887, and, judging from the success which the undertaking met with at that time, and taking into consideration the interest shown at present among medical men and the public at large in hygiene, the usefulness of the new exposition would seem to be assured. At present there are nine committees at work: (1) Physico-chemical, (2) parasital, (3) architectural, (4) pedagogical, (5) on hygiene of industry, (6) on hospitals, (7) pharmaceutical, (8) statistical, and (9) public hygiene. The several committees have been assigned the following subjects:

1. The Committee on Physico-chemistry will take into consideration (*a*) air, water, light; (*b*) food in general; and (*c*) articles connected with the above, as kitchen utensils, paints, wall-paper, and poisonous vegetables.

2. The Parasital Committee, the question of sterilization; also, the utensils used for the culture of bacilli, showing exhaustively the method of ascertaining their presence and the means for their destruction.

3. The Architectural Committee, human dwellings in general, past and present, and the latest improvements in hygienic building.

4. The Pedagogical Committee, the hygienic mode of caring for children; construction of school-houses; all systems of school education, and school-rooms and furniture.

5. The Committee on Hygiene of Industry, the hygienic conditions prevailing in the homes of laborers, shops, and factories; also, food and drink and vital statistics.

6. The Committee on Hospitals, the history and statistics of hygiene and the modern hospitals of the world.

7. The Pharmaceutical Committee, the literature and history of pharmacy, patent medicines, furniture, medical implements, and all pharmaceutical utensils.

8. The Committee on Statistics, the blanks, plans, diagrams, drawings, books, and all printed matter on the subject of hygiene, meteorology, geology, hydrography, and anthropology in all their details and all sciences connected therewith; also, to provide a series of lectures and reports on its work.

9. The Committee on Public Hygiene, the manner of living, dwellings, etc., of all classes of the population from a sanitary point of view.

Each of the above committees is composed of at least three members selected from among the doctors of medicine, professors, engineers, and other specialists under the presidency of the General Committee, composed as follows: Professor Brodewski, President; Professor Pizewski, Vice-President; Professor Proicke and Engineers Grotowski and Mascicki, Members; and M. Polak, M.D., Secretary.

Awards of gold, silver, and bronze medals will be made; also, diplomas and letters of honor.

P. BLAKISTON, SON & CO., of Philadelphia, announce a book on "Appendicitis," by John B. Deaver, M.D., Assistant Professor of Applied Anatomy, University of Pennsylvania; Assistant Surgeon to the German Hospital, etc. The book will be arranged in a practical and systematic manner. It will contain about forty illustrations of methods of procedure in operating, and typical pathological conditions of the appendix, the latter being printed in colors.

*The College and Clinical Record* will be hereafter known under the name of "DUNGLISON'S COLLEGE AND CLINICAL RECORD: a Monthly Journal of Practical Medicine." Richard J. Dunglison, M.D., Philadelphia, Pa.

## PUBLICATIONS RECEIVED.

L'Eau potable, par F. Coreil, M. Baillière et Fils.

Report of Bureau of Statistics of Labor, New York.

Report of Supervising Surgeon-General, U. S. M. H. S.

Report of Surgeon-General, U. S. Army.

Report of Bureau of Education.

Transactions of Medical Society of Connecticut.

Proceedings of Medical Society of North Carolina.

Bulletins Cornell University, Agricultural Experiment Station, Ithaca, N. Y.;

99 and 100. Blackberries and Evaporated Blackberries, by L. H. Bailey.

101. The Spraying of Trees, with Remarks on the Canker Worm, and

102. Care of Fruit Trees, by L. H. Bailey.

103. Soil Depletion in Respect to the Care of Fruit Trees, by I. P. Roberts.

Is Antitoxin Curative in Diphtheria? Some of its Dangerous Effects. Joseph E. Winters, M.D., New York.

The Osteopathic Fad. A. J. Steele, M.D., St. Louis, Mo.

Aseptic Prophylaxis of Asiatic Cholera: Arsenization. Reginald Barkly Leach, M.D., Paris, Tex.

Vaginal Hysterectomy by Galvano Cautery. John Byrne, M.D., Brooklyn, N. Y.

Hydrosalpinx. Hunter Robb, M.D., Baltimore, Md.

Locoweed. Carl Ruedi, M.D., Denver, Col.

Clinical Notes on Psoriasis. L. Duncan Bulkley, M.D., New York.

Forestry in Our Schools. J. O. Barrett, Minneapolis, Minn.

Mary A. Dixon Jones, M.D., Brooklyn, N. Y. Recent Papers:

Carcinoma on the Floor of the Pelvis;

Colpo-Hysterectomy for Malignant Disease;

Criminal Abortion;

Diagnosis and Some of the Clinical Aspects of Gyroma and Endothelioma of the Ovary;

Sterility in Woman, Causes, Treatment, and Illustrative Cases.

Thomas H. Manley, M.D., New York. Recent Papers:

Deformities following Fractures of the Shafts of Bones, with Observations on Treatment;

Limitation of Surgical Operations as a Means of Relief or Cure in Epilepsy.

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## FOODS: NUTRITIVE VALUE AND COST.*

By W. O. ATWATER, Ph.D., Professor of Chemistry in Wesleyan University.

### THE NUTRIMENT IN FOOD AND HOW IT IS USED IN THE BODY.

A QUART of milk, three quarters of a pound of moderately fat beef—sirloin steak, for instance—and five ounces of wheat flour, all contain about the same amount of nutritive material; but we pay different prices for them, and they have different values for nutriment. The milk comes nearest to being a perfect food. It contains all of the different kinds of nutritive materials that the body needs. Bread made from the wheat flour will support life. It contains all of the necessary ingredients for nourishment, but not in the proportions best adapted for ordinary use. A man might live on beef alone, but it would be a very one-sided and imperfect diet. But meat and bread together make the essentials of a healthful diet. Such are the facts of experience. The advancing science of later years explains them. This explanation takes into account, not simply quantities of meat and bread and milk and other materials which we eat, but also the nutritive ingredients or "nutrients" which they contain.

### CHEMICAL COMPOSITION OF FOOD MATERIALS—QUANTITIES OF NUTRIENTS.

*Edible portion and refuse.*—If the reader will take the pains to notice the next piece of beef that he has to carve for dinner

* Abstract of Report to United States Department of Agriculture.

he will observe, first of all, that along with the meat which is good to eat there is more or less of bone, which, except in so far as it may be used for soup, is of no value for food. If, however, the meat man has already cut out the bone, only the edible portion will be left. Beef, then, consists of edible portion and refuse. The same is true of fish, in which the bones and entrails and sometimes the skin are the refuse. In eggs there is a corresponding distinction between the shells and the so-called "meat." The inside of the potato and the wheat flour are the edible portion, and the skin and bran are the refuse of the potato and wheat.

If we weigh the whole meat, bone and all, to start with, and afterward weigh bone and meat separately, we can easily calculate the percentages of refuse and edible portion. The proportions of refuse are from 8 to 10 per cent in a round of beef, about 14 per cent in eggs, 18 per cent in a leg of mutton, 40 per cent in chicken, and 50 per cent or more in some kinds of fish. In such food materials as milk, flour, and bread there is of course no refuse.

*Water and nutrients.*—Meat freed from bone, milk, and flour all contain more or less water. This can be dried out by heating, as is done in the chemical analysis of food materials. The proportions of water in different food materials vary greatly. Ordinary flour contains about 12½ per cent, or one eighth. The fatter kinds of meat have from 15 to 50 per cent, and the leaner meats from 50 to 75 per cent of water. One third of the weight of bread and three fourths of the weight of potatoes consist of water. The water in all these substances is precisely the same as any other water, and has no more value for nutriment.

The material which remains in the edible portion of the food after removal of the water is called by chemists "water-free substance." It includes all of the actually nutritive ingredients or nutrients of the food. The nutrients are of several kinds. They are commonly divided into four classes called protein, fats, carbohydrates, and mineral matters. Water permeates all parts of the body, and is indispensable for nourishment, but the water of the food is not transformed in the body as are the protein, fats, and carbohydrates, and it is not usually taken into account in estimates of nutritive value.

*Protein.*—Meat consists of lean and fat. Part of the fat is in large lumps, which can be easily separated from the lean. Indeed, we often cut out the fat of the meat which is served on our plates at the table and reject it. But a portion of the fat is in very fine particles diffused throughout the lean. Much of this finely divided fat is in particles so small as to be invisible to the naked eye, but it is possible to separate them very completely from the lean by processes of analysis common in the laboratory. After the water and the fat have been removed from the lean meat, the material which remains will contain a little mineral matter, which would be left as ash if it were burned; the rest consists chiefly of so-called protein compounds. The protein is the chief nutritive constituent of fish and eggs as well as of lean meat. The albumen and casein of milk are also protein compounds. The gluten of wheat consists of protein compounds. These compounds occur in corn, beans, potatoes, and indeed all kinds of vegetable foods.

One trouble in speaking of these substances is that they are known by so many different names. The terms "nitrogenous compounds," "albuminoids," and "proteids" are often applied to them. The first term is very proper, because the protein compounds contain the element nitrogen, which is not found in the other classes of nutrients. The term "albuminoids" comes from albumen, a substance familiar to us in the white of egg, and is applied to the compounds which are similar to albumen. Some writers prefer the word "proteids" for substances of this class.

Along with the muscle the meat contains tendon and cartilage, which are familiarly called gristle. These materials and the ossein, or "animal matter" of bone, are very similar to gelatin (glue), and are changed to gelatin on heating with water. They are hence termed gelatinoids. The gelatinoids are the principal ingredients of tendon and similar tissues, while the albuminoids are the chief ingredients of muscle.

There is still another class of nitrogenous substances in meat, which, though small in quantity, are very interesting. They are known in the chemical laboratory as creatin, creatinin, carnin, etc., and are grouped together as "extractives," because they are extracted from flesh by water. They are the chief constituents of beef tea and most meat extracts.

The albuminoids and gelatinoids may be properly grouped together as proteids. It is customary to use the term protein to include albuminoids, gelatinoids, and extractives.

*Fat.*—Fat is familiar to us in meat, from which we get it in the form of tallow and lard; in milk, from which it is obtained as butter; and in the various vegetable oils, such as olive oil, cotton-seed oil, and the oils of wheat and corn. Larger or smaller proportions of fat are found in most food materials.

*Carbohydrates.*—Potatoes, wheat, and corn contain large proportions of starch. Sugar-cane and sorghum are rich in sugar. Starch and sugar are very similar in chemical composition, and are called carbohydrates. Other carbohydrates are found in animals and plants, such as glycogen or "animal starch," which is found in the liver, and cellulose, which occurs in plants.

*Ash.*—The mineral matter, or ash, which is left behind when animal or vegetable matter is burned, consists of a variety of chemical compounds commonly called salts, and includes phosphates, sulphates, and chlorides of the metals, calcium, magnesium, potassium, and sodium. Calcium phosphate, or phosphate of lime, is the chief mineral constituent of bone. Common salt is chloride of sodium.

These substances are separated from each other in the laboratory by various methods of analysis. The every-day handling of food materials also involves crude processes of analysis.

We let milk stand; the globules of fat rise in cream, still mingled, however, with water, protein, carbohydrates, and mineral salts. To separate the other ingredients from the fat, the cream is churned. The more perfect this separation—*i.e.*, the more accurate the analysis—the better will be the butter. Put a little rennet into the skimmed milk and the casein, called in chemical language an albuminoid or protein compound, will be curdled and may be freed from the bulk of the water, sugar, and other ingredients by the cheese press. To separate milk sugar, a carbohydrate, from the whey is a simple matter. One may see it done by Swiss shepherds in their Alpine huts; but farmers find it more profitable to put it in the pigpen, the occupants of which are endowed with the happy faculty of transforming the sugar, starch, and other carbohydrates of their food into the fat of pork.

CLASSES OF NUTRIENTS.

The following are familiar examples of compounds of each of the four principal classes of nutrients:

PROTEIN.
- *Proteids.*
  - *Albuminoids—e.g.*, albumen (white of eggs); casein (curd) of milk; myosin, the basis of muscle (lean meat); gluten of wheat, etc.
  - *Gelatinoids—e.g.*, collagen of tendons; ossein of bones; which yield gelatin or glue, etc.
- Meats and fish contain very small quantities of so-called "extractives." They include kreatin and allied compounds, and are the chief ingredients of beef-tea and meat-extract. They contain nitrogen, and hence are commonly classed with protein.

*Fats—e.g.*, fat of meat; fat (butter) of milk; olive oil; oil of corn, wheat, etc.

*Carbohydrates—e.g.*, sugar, starch, cellulose (woody fibre), etc.

*Mineral matters—e.g.*, phosphate of lime, sodium chloride (common salt), etc.

The farm boy who on cold winter mornings goes to the barn to feed the cattle, and solaces himself by taking grain from the wheat bin and chewing it into what he calls "wheat gum," makes, unknowingly, a rough sort of analysis of the wheat. With the crushing of the grain and the action of saliva in his mouth the starch, sugar, and other carbohydrates are separated. Some of the fat—*i.e.*, oil—is also removed, and finds its way with the carbohydrates into the stomach. The tenacious gluten, which contains the albuminoids or protein and constitutes what he calls the gum, is left. When, in the natural order of events, the cows are cared for and the gum is swallowed, its albuminoids enter upon a round of transformation in the boy's body, in the course of which they are changed into other forms of protein, such as albumen of blood or myosin of muscle; or are consumed with the oil and sugar and starch to yield heat to keep his body warm and give him muscular strength for his work or play.

What has been said of the ingredients of food may be briefly recapitulated as follows :

Ordinary food materials, such as meat, fish, eggs, potatoes, wheat, etc., consist of—

*Refuse.*—As the bones of meat and fish, shells of shellfish, skin of potatoes, bran of wheat, etc.

*Edible portion.*—As the flesh of meat and fish, the white and yolk of eggs, wheat flour, etc. The edible portion consists of *water* and *nutritive ingredients* or *nutrients.*

The principal kinds of nutritive ingredients are *protein, fats, carbohydrates,* and *mineral matters.*

The water, refuse, and salt of salted meat and fish are called non-nutrients. In comparing the values of different food materials for nourishment they are left out of account.

## HOW FOOD IS USED IN THE BODY.

Blood and muscle, bone and tendon, brain and nerve—all the organs and tissues of the body—are built from the nutritive ingredients of food. With every motion of the body, and with the exercise of feeling and thought as well, material is consumed and must be resupplied by food. In a sense, the body is a machine. Like other machines, it requires material to build up its several parts, to repair them as they are worn out, and to serve as fuel. In some ways it uses this material like a machine ; in others it does not. The steam-engine gets its power from fuel ; the body does the same. In the one case coal or wood, in the other food, is the fuel. In both cases the energy which is latent in the fuel—the potential energy, as it is called in scientific language—is transformed into heat and power. When the coal is burned in the furnace a part of its potential energy is transformed into the mechanical power which the engine uses for its work ; the rest is changed to heat which the engine does not utilize and which, therefore, is wasted. The potential energy of the food is transformed in the body into heat and mechanical power. The heat is used to keep the body warm. The mechanical power is employed for muscular work. The material of which the engine is built is very different from that which it uses for fuel, but part of the material which serves the body for fuel also builds it up and keeps it in repair. Further-

more, the body uses its own substance for fuel. This the steam-engine cannot do at all. The steam-engine and the body are alike in that both convert the fuel into heat and mechanical power. They differ in that the body uses the same material for fuel as for building, and also consumes its own material for fuel. In its use of fuel the body is much more economical than any engine.

The body is more than a machine. We have not simply organs to build and keep in repair and supply with energy; we have a nervous organization; we have sensibilities and the higher intellectual and spiritual faculties, and the right exercise of these depends upon the right nutrition of the body.

The chief uses of food, then, are two: (1) To form the material of the body and repair its wastes; (2) to yield heat to keep the body warm and muscular and other power for the work it has to do. In forming the tissues and the fluids of the body the food serves for building and repair. In yielding heat and power it serves as fuel.

The different nutrients of food serve the body in different ways. The principal tissue formers are the protein compounds, especially the albuminoids. These make the flesh of the body. They build up and repair the nitrogenous materials, as the muscles and tendons, and supply the albuminoids of the blood, milk, and other fluids. The chief fuel ingredients of the food are the carbohydrates and fats. These are either consumed in the body when the food is eaten or they are stored as fat to be used as occasion demands.

The albumen of eggs, the casein of milk and cheese, the gluten of wheat, the myosin of lean meat, and the other albuminoids of food are transformed into the albuminoids and gelatinoids of the body. Muscle, tendon, and cartilage are made of albuminoids.

The albuminoids of food also serve as fuel. A dog can live on lean meat; he can convert it into muscle, heat, and muscular power. The gelatinoids of food, as the finer particles of tendon and the gelatin, which is dissolved out of bone and meat in making soup, though somewhat similar to the albuminoids in composition, are not tissue formers; but they are used as fuel and hence are valuable nutrients.

The albuminoids are sometimes called "flesh formers" or

"muscle formers" because the lean flesh, the muscle, is made from them.

The starch of bread and potatoes and sugar are burned in the body to yield heat and power. The fats, such as the fat of meat and butter, serve the same purpose, only they are a more concentrated fuel than the carbohydrates.

The fats of the food are stored in the body. The body also transforms the carbohydrates of food into fat. This fat, and with it that stored from the fat of food, is kept in the body as a reserve of fuel in the most concentrated form. One chief use of the fat stored in the body is for fuel, to be drawn on in case of need.

The different nutrients can to a greater or less extent do one another's work. If the body has not enough of one for fuel it can use another. But while the protein can be burned in the place of fats and carbohydrates, neither of the latter can take the place of the albuminoids in building and repairing the tissues. At the same time the gelatinoids, fats, and carbohydrates, by being consumed themselves, protect the albuminoids from consumption.

### THE FUEL VALUE OF FOOD.

Heat and muscular power are forms of force or energy. The energy is developed as the food is consumed in the body. It is measured in the laboratory by means of an apparatus called the calorimeter. The unit commonly used is the calorie, the amount of heat which would raise the temperature of a pound of water 4° F.

Taking ordinary food materials as they come, the following general estimate has been made for the average amount of heat and energy in one pound of each of the classes of nutrients:

| | Calories. |
|---|---|
| In 1 pound of protein | 1,860 |
| In 1 pound of fats | 4,220 |
| In 1 pound of carbohydrates | 1,860 |

In other words, when we compare the nutrients in respect to their fuel values, their capacities for yielding heat and mechanical power, a pound of protein of lean meat or albumen of egg is just about equivalent to a pound of sugar or starch,

and a little over two pounds of either would be required to equal a pound of the fat of meat or butter or the body fat.

Before the invention of matches, blacksmiths used to start their fires with iron heated by hammering. The heating of the iron was a case of the conversion of one form of energy into another. The muscular energy of the blacksmith's arm was transformed into the mechanical energy of the descending hammer; when the hammer struck, the energy was imparted to the iron, where it was transmuted into heat, and the iron became red-hot. The energy came from the blacksmith's food. Just how all the energy of the food is disposed of in the body, experimental science has not yet told us; but it is certain that part of it is converted into heat and part into the mechanical energy exerted by the muscles. Some of it may be transformed into electricity.

There is no doubt that intellectual activity also is somehow dependent upon the consumption of material which the brain has obtained from the food, but just what substances are consumed to produce brain and nerve force, and how much of each is required for a given quantity of intellectual labor, are questions which the chemist's balance and calorimeter do not answer.

The coal and wood we burn, the plants we grow, the food we eat, and the reserve materials in our bodies are reservoirs of latent energy. The source of that energy is the sun. The science of later years is explaining how the energy of the sun warms and lights our planet; how it is stored in coal and petroleum and wood; and how it is transformed into the heat of the furnace, the light of the lamp, the mechanical power of steam, or into electricity and then into light or heat or mechanical power again. The same energy from the sun is stored in the protein and fats and carbohydrates of food, and the physiologists to-day are telling us how it is transmuted into the heat that warms our bodies and into strength for our work and thought.

What has been said above about the ways in which our food nourishes us may be briefly summarized as follows:

WAYS IN WHICH FOOD IS USED IN THE BODY.

Food supplies the wants of the body in several ways. It either—

Is used to form the tissues and fluids of the body ;
Is used to repair the wastes of tissues ;
Is stored in the body for future consumption ;
Is consumed as fuel, its potential energy being transformed into heat or muscular energy, or other forms of energy required by the body ; or,
In being consumed protects tissues or other food from consumption.

USES OF THE DIFFERENT CLASSES OF NUTRIENTS.

Protein forms tissue (muscle, tendon, etc., and fat) and serves as fuel.
Fats form fatty tissue (not muscle, etc.) and serve as fuel.
Carbohydrates are transformed into fat and serve as fuel.

} All yield energy in form of heat and muscular strength.

In being themselves burned to yield energy the nutrients protect each other from being consumed. The protein and fats of body tissue are used like those of food. An important use of the carbohydrates and fats is to protect protein (muscle, etc.) from consumption.

DEFINITION OF FOOD AND FOOD ECONOMY.

The views thus presented lead to the following definitions : (1) Food is that which, taken into the body, builds tissues or yields energy ; (2) the most healthful food is that which is best fitted to the wants of the user ; (3) the cheapest food is that which furnishes the largest amount of nutriment at the least cost ; (4) the best food is that which is both most healthful and cheapest.

We have, then, to consider the kinds and amounts of nutrients in different food materials, their digestibility, and the kinds and amounts needed for nourishment by people doing different kinds of work.

NUTRITIVE VALUES OF DIFFERENT FOOD MATERIALS.

The nutritive value of foods depends mainly upon the amounts and proportions of actually nutritive materials which they contain. Of course the digestibility and the ways in which they "agree and disagree" with different people are important factors of the nutritive value. We will consider first the chemical composition.

## COMPOSITION OF FOOD MATERIALS.

Table A gives the percentages of nutrients and the calories of energy found by analysis of specimens of different food materials. Chart I shows the composition of a smaller number, the nutrients, water, and refuse being indicated by bands, and the energy by black lines.

In considering the table and chart it must be remembered that many of our food materials as they are bought in the market include, along with the edible portion, more or less of what is called refuse, like the bone of meat, the shells of eggs, and skin of potatoes. The table and chart show the composition of these materials as we buy them and also the composition of the edible portion. Materials like milk, flour, and bread have no refuse.

Another important consideration is the amount of water in the edible portion of the food, as also may be seen in Table A.

TABLE A.—*Composition of different food materials.*

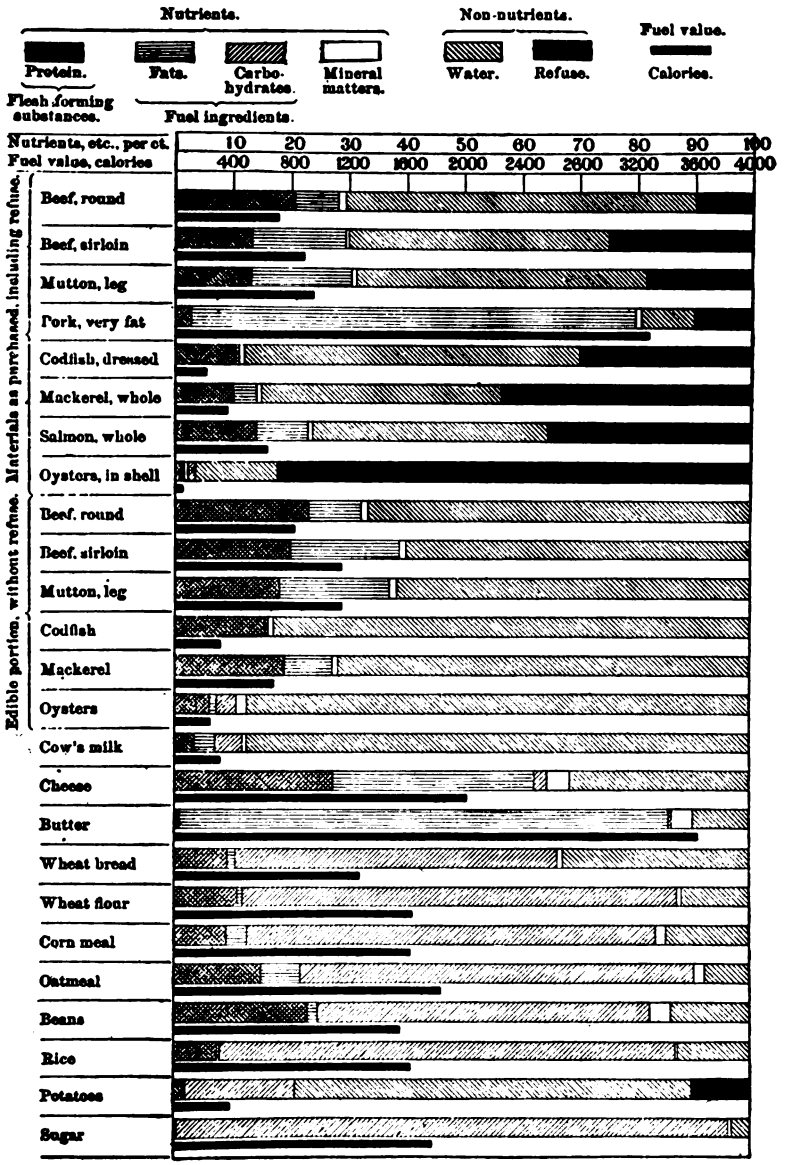
| Food materials. | Refuse (bones, skin, shell, etc.). | Edible portion. | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | Water. | Nutrients. | | | | | Fuel value of 1 pound. |
| | | | Total. | Protein. | Fat. | Carbohydrates. | Mineral matters. | |
| *Animal foods, as purchased.* | | | | | | | | |
| Beef. | *Per ct.* | *Per ct.* | *Per ct.* | *Per ct.* | *Per ct.* | *Per ct.* | *Per ct.* | *Cal* |
| Neck | 20 | 49.6 | 30.4 | 15.6 | 14 | ..... | .8 | 880 |
| Shoulder | 12.6 | 55.8 | 31.6 | 17 | 13.7 | ..... | .9 | 895 |
| Chuck rib | 14.6 | 49.5 | 35.9 | 15 | 20.1 | ..... | .8 | 1,125 |
| Rib | 21 | 38.2 | 40.8 | 12.2 | 27.9 | ..... | .7 | 1,405 |
| Sirloin | 19.5 | 48.3 | 32.2 | 15 | 16.4 | ..... | .8 | 970 |
| Round steak | 7.8 | 60.9 | 31.3 | 18 | 12.3 | ..... | 1 | 855 |
| Side, without kidney fat | 19.2 | 44.3 | 36.5 | 13.9 | 21.8 | ..... | .8 | 1,180 |
| Rump, corned | 5 | 70.8 | 24.2 | 16.7 | 5.1 | ..... | 2.4 | 525 |
| Flank, corned | 12.1 | 43.7 | 44.2 | 12.4 | 29.2 | ..... | 2.6 | 1,460 |
| Veal, shoulder | 17.9 | 56.7 | 25.4 | 16.6 | 7.9 | ..... | .9 | 640 |
| Mutton: | | | | | | | | |
| Shoulder | 16.3 | 49 | 34.7 | 15.1 | 18.8 | ..... | .8 | 1,075 |
| Leg | 18.1 | 50.6 | 31.3 | 15 | 15.6 | ..... | .7 | 935 |
| Loin | 15.8 | 41.5 | 42.7 | 12.6 | 29.5 | ..... | .6 | 1,480 |
| Side, without kidney fat | 17.3 | 44.2 | 38.5 | 14 | 23.7 | ..... | .8 | 1,260 |
| Pork: | | | | | | | | |
| Shoulder roast, fresh | 14.6 | 43 | 42.4 | 13.6 | 28 | ..... | .8 | 1,435 |
| Ham, salted, smoked | 11.4 | 36.8 | 51.8 | 14.8 | 34.6 | ..... | 2.4 | 1,785 |
| Chicken | 38.2 | 44.6 | 17.2 | 15.1 | 1.2 | ..... | .9 | 330 |
| Turkey | 32.4 | 44.7 | 22.9 | 16.1 | 5.9 | ..... | .9 | 550 |
| Eggs, in shell | 13.7 | 63.1 | 23.2 | 12.1 | 10.2 | ..... | .9 | 655 |
| Fish, etc.: | | | | | | | | |
| Flounder, whole | 66.8 | 27.2 | 6 | 5.2 | .3 | ..... | .5 | 110 |
| Bluefish, dressed | 48.6 | 43 | 11.1 | 9.8 | .6 | ..... | .7 | 210 |
| Codfish, dressed | 29.9 | 58.5 | 11.6 | 10.6 | .2 | ..... | .8 | 205 |
| Shad, whole | 50.1 | 35.2 | 14.7 | 9.2 | 4.8 | ..... | .7 | 375 |
| Mackerel, whole | 44.8 | 40.4 | 15 | 10 | 4.3 | ..... | .7 | 365 |
| Halibut, dressed | 17.7 | 61.9 | 20.4 | 15.1 | 4.4 | ..... | 9 | 465 |
| Salmon, whole | 35.3 | 40.6 | 24.1 | 14.3 | 8.8 | ..... | 1 | 635 |
| Salt codfish | 42.1 | 40.5 | 17.6 | 16 | .4 | ..... | 1.2 | 315 |
| Smoked herring | 50.9 | 19.2 | 29.9 | 20.2 | 8.8 | ..... | .9 | 745 |
| Salt mackerel | 40.4 | 28.1 | 31.5 | 14.7 | 15.1 | ..... | 1.7 | 910 |
| Canned salmon | 4.9 | 50.3 | 35.8 | 19.3 | 15.3 | ..... | 1.2 | 1,005 |
| Lobsters | 62.1 | 31 | 6.9 | 5.5 | .7 | .1 | .6 | 135 |
| Oysters | 82.3 | 15.4 | 2.3 | 1.1 | .3 | .6 | .4 | 40 |

TABLE A.—*Composition of different food materials*—Continued.

| Food materials. | Refuse (bones, skin, shell, etc.). | Edible portion. | | | | | | Fuel value of 1 pound. |
|---|---|---|---|---|---|---|---|---|
| | | Water. | Nutrients. | | | | | |
| | | | Total. | Protein. | Fat. | Carbohydrates. | Mineral matters. | |
| *Animal foods, edible portion.* | | | | | | | | |
| Beef: | *Per ct.* | *Per ct.* | *Per ct.* | *Per ct.* | *Per ct.* | *Per ct.* | *Per ct.* | *Cal.* |
| Neck | | 62 | 38 | 19.5 | 17.5 | | 1 | 1,100 |
| Shoulder | | 63.9 | 36.1 | 19.5 | 15.6 | | 1 | 1,020 |
| Chuck rib | | 58 | 42 | 17.6 | 23.5 | | .9 | 1,280 |
| Rib | | 48.1 | 51.9 | 15.4 | 35.6 | | .9 | 1,790 |
| Sirloin | | 60 | 40 | 18.5 | 20.5 | | 1 | 1,210 |
| Round | | 68.2 | 31.8 | 20.5 | 10.1 | | 1.2 | 805 |
| Side, without kidney fat | | 54.8 | 45.2 | 17.2 | 27.1 | | .9 | 1,465 |
| Rump, corned | | 58.1 | 41.9 | 13.3 | 26.6 | | 2 | 1,370 |
| Flank, corned | | 49.8 | 50.2 | 14.2 | 33 | | 3 | 1,655 |
| Veal, shoulder | | 66.8 | 31.2 | 20.2 | 9.8 | | 1.2 | 790 |
| Mutton: | | | | | | | | |
| Shoulder | | 58.6 | 41.4 | 18.1 | 22.4 | | .9 | 1,280 |
| Leg | | 61.8 | 38.2 | 18.3 | 19 | | .9 | 1,140 |
| Loin | | 49.3 | 50.7 | 15 | 35 | | .7 | 1,755 |
| Side, without kidney fat | | 53.5 | 46.5 | 16.9 | 28.7 | | .9 | 1,525 |
| Pork: | | | | | | | | |
| Shoulder roast, fresh | | 50.3 | 49.7 | 16 | 32.8 | | .9 | 1,680 |
| Ham, salted, smoked | | 41.5 | 58.5 | 16.7 | 39.1 | | 2.7 | 1,900 |
| Fat, salted | | 12.1 | 87.9 | .9 | 82.8 | | 4.2 | 3,510 |
| Sausage: | | | | | | | | |
| Pork | | 41.5 | 58.8 | 13.8 | 42.8 | | 2.2 | 2,065 |
| Bologna | | 62.4 | 37.6 | 18.8 | 15.8 | | 3 | 1,015 |
| Chicken | | 72.2 | 27.8 | 24.4 | 2 | | 1.4 | 540 |
| Turkey | | 66.2 | 33.8 | 23.9 | 8.7 | | 1.2 | 810 |
| Eggs | | 73.8 | 26.2 | 14.0 | 10.5 | | 8 | 721 |
| Milk | | 87 | 13 | 3.6 | 4 | 4.7 | 7 | 325 |
| Butter | | 10.5 | 89 | 1 | 85 | .6 | 3 | 3,615 |
| Oleomargarine | | 11 | 89.5 | .6 | 85 | .4 | 3 | 3,605 |
| Cheese: | | | | | | | | |
| Full cream | | 30.2 | 69.8 | 28.3 | 35.5 | 1.8 | 4.2 | 2,070 |
| Skim milk | | 41.3 | 58.7 | 38.4 | 6.8 | 8.9 | 4.6 | 1,165 |
| Fish: | | | | | | | | |
| Flounder | | 84.2 | 15.8 | 13.8 | .7 | | 1.3 | 285 |
| Haddock | | 81.7 | 18.3 | 16.8 | .3 | | 1.2 | 325 |
| Codfish | | 82.6 | 17.4 | 15.8 | .4 | | 1.2 | 310 |
| Shad | | 70.6 | 29.4 | 16.6 | 9.5 | | 1.3 | 745 |
| Mackerel | | 73.4 | 26.6 | 18.2 | 7.1 | | 1.3 | 640 |
| Halibut | | 75.4 | 24.6 | 18.3 | 5.2 | | 1.1 | 580 |
| Salmon | | 63.6 | 36.4 | 21.6 | 13.4 | | 1.4 | 965 |
| Salt cod | | 53.6 | | 21.4 | .3 | | 1.6 | 410 |
| Herring, salt | | 34.6 | | 26.4 | 15.8 | | 1.5 | 1,345 |
| Mackerel, salt | | 43.4 | | 17.3 | 26.4 | | 2.6 | 1,860 |
| Oysters | | 87.1 | 12.9 | 6 | 1.2 | 3.7 | 2 | 230 |
| *Vegetable foods.* | | | | | | | | |
| Wheat flour | | 12.5 | 87.5 | 11 | 1.1 | 74.9 | .5 | 1,645 |
| Graham flour (wheat) | | 13.1 | 86.9 | 11.7 | 1.7 | 71.7 | 1.8 | 1,625 |
| Rye flour | | 13.1 | 86.9 | 6.7 | .8 | 78.7 | .7 | 1,625 |
| Buckwheat flour | | 14.6 | 85.4 | 6.0 | 1.4 | 76.1 | 1 | 1,605 |
| Oatmeal | | 7.6 | 92.4 | 15.1 | 7.1 | 68.2 | 2 | 1,850 |
| Corn meal | | 15 | 85 | 9.2 | 3.8 | 70.6 | 1.4 | 1,645 |
| Rice | | 12.4 | 87.6 | 7.4 | .4 | 79.4 | .4 | 1,630 |
| Peas | | 12.3 | 87.7 | 26.7 | 1.7 | 56.4 | 2.9 | 1,565 |
| Beans | | 12.6 | 87.4 | 23.1 | 2 | 59.2 | 3.1 | 1,615 |
| Potatoes | | 78.9 | 21.1 | 2.1 | .1 | 17.9 | 1 | 375 |
| Sweet potatoes | | 71.1 | 28.9 | 1.5 | .4 | 26 | 1 | 580 |
| Turnips | | 89.4 | 10.6 | 1.2 | .2 | 8.2 | 1 | 185 |
| Carrots | | 88.6 | 11.4 | 1.1 | .4 | 8.9 | 1 | 200 |
| Onions | | 87.6 | 12.4 | 1.4 | .3 | 10.1 | .6 | 225 |
| String beans | | 87.2 | 12.8 | 2.2 | .4 | 9.4 | .8 | 225 |
| Green peas | | 78.1 | 21.9 | 4.4 | .6 | 16 | .9 | 405 |
| Green corn | | 81.3 | 18.7 | 2.8 | 1.1 | 13.2 | .6 | 345 |
| Tomatoes | | 96 | 4 | .8 | .4 | 2.5 | .3 | 80 |
| Cabbage | | 91.9 | 8.1 | 2.1 | .3 | 5.5 | 1.1 | 155 |
| Apples | | 83.2 | 16.8 | .2 | .4 | 15.9 | .3 | 315 |
| Sugar, granulated | | 2 | 98 | | | 97.8 | .2 | 1,820 |
| Molasses | | 24.6 | 75.4 | | | 73.1 | 2.3 | 1,360 |
| White bread (wheat) | | 32.3 | 67.7 | 8.8 | 1.7 | 56.3 | .9 | 1,220 |
| Boston crackers | | 8.3 | 91.7 | 10.7 | 9.9 | 66.7 | 2.4 | 1,895 |

## Chart 1.—Composition of Food Materials.

*Nutritive ingredients, refuse, and fuel value.*



In general, animal foods contain the most water and vegetable foods the most nutrients, though potatoes and turnips are exceptions, the former being three fourths and the latter nine tenths water. Butter, on the other hand, though one of the animal foods, generally has ten or more per cent of water. The milk from which it is made is not far from seven eighths water. Meats have more water in proportion as they have less fats, and *vice versa*, the fatter the meat the less the amount of water in it. Thus, very lean beef (the muscle of a lean animal from which the fat has been trimmed off) may have 78 per cent of water and only 22 per cent of nutrients. The rather fat sirloin may have two fifths, and very fat pork one tenth or less of water. The flesh of fish is in general more watery than ordinary meats, that of salmon being five eighths water, codfish over four fifths, and flounder over six sevenths. Flour and meal have but little water, and sugar when well dried has almost none.

In examining the proportions of individual nutrients—protein, fats, and carbohydrates—the most striking fact is the difference between the meats and fish on the one hand and the vegetable foods on the other. The vegetable foods are rich in carbohydrates, like starch and sugar, while the meats have not enough to be worth mentioning. On the other hand, the meats abound in protein and fats, of which the vegetable foods usually have but little. Beans and oatmeal, however, are rich in protein, while fat pork has very little.

In the first glance at a table like this people sometimes obtain a wrong impression. For instance, rice consists of about seven eighths and potatoes only one fourth nutritive materials. The first inference is that rice is more than three times as nutritious as potatoes. In one sense this is true—that is to say, a pound of rice contains more than three times as much nutrients as a pound of potatoes. But if we take enough of potatoes to furnish as much nutritive material as the pound of rice, the composition and nutritive value of the two will be just about the same. In cooking the rice we mix water with it, and may thus make a material not very different in composition from potatoes. By drying the potatoes they could be made very similar in composition and food value to rice. Taken as we find them, a pound of rice and three and one

half pounds of potatoes would contain nearly equal weights of each class of nutrients and would have about the same nutritive value.

The fats have, weight for weight, about two and one fourth times the potential energy of either the protein or the carbohydrates. Water has no potential energy. Hence the food materials which have the most fat and the least water have the highest fuel value. Butter and fat pork consist almost exclusively of fat. They lead the other food materials in fuel value. Lard, suet, and olive oil have even less water, and hence exceed the butter in this respect. Oleomargarine (see Table A) has about the same composition, fuel value and food value, as butter.

The different kinds of meat differ even more in proportions of fat than one would suppose from their appearance. The figures given in these tables represent the averages of analyses thus far made of American meats. Comparatively few samples have been analyzed, however, and probably future investigations will change these figures more or less. Indeed meats are so variable in composition that it is very difficult to say just what are the average figures. Generally speaking, veal is the leanest and pork the fattest of ordinary meats. Mutton is apt to be a little fatter than beef. Of the different cuts of beef, the loin, rump, and shoulder are among the leanest, while the ribs and flank are the fattest. Mutton and lamb furnish about the same amount of protein and have the same fuel value as the fatter cuts of beef. The loin is the fatter part of beef and mutton. This is especially the case with mutton, because the leaf fat is usually included with the loin as it is sold in the markets, while in the case of beef the tallow and suet, and in the case of swine the leaf lard, are cut out. Pork is so much fatter than the flesh of beef and mutton that even the strictly "lean cuts," as the lean after the removal of the leaf is called, contain relatively as much fat as the fattest cuts of other meats. The case is similar with smoked ham, though the large proportion of fat is due in part to the loss of water in preparation. Among the prepared meats, canned corn beef, which is ordinarily cooked before canning, is worthy of especial notice. It has a large amount of both protein and fats. Like most other kinds of canned meats,

the corned beef is free from bone. It furnishes more protein, pound per pound, than most kinds of fresh beef, and stands very high in fuel value.

Chicken and turkey have less fat than the fatter meats. In spite of their large amount of refuse, bone, etc., they furnish quite large quantities of protein.

Fish have in general so much refuse and the flesh contains so much water that the proportions of nutrients are smaller than in ordinary meats. The white-fleshed fish, as cod and haddock, have very little fat. Fish with darker meats, such as shad and mackerel, are rich in fats. Salmon has considerable fat and approaches beef in composition. The difference in composition between dry salt cold and fresh cod is due chiefly to the loss of water in the drying and salting. Many persons are surprised to learn that oysters have about the same proportions of nutrients as milk. Indeed, there is very little difference in the nutritive values of the two when estimated by the quantities of nutrients and energy. Milk is, however, more nearly a "perfect" or "normal" food, if it is right to call any single food perfect or normal. Oysters are so richly prized because of their flavor. Cheese made of whole milk contains nearly all of the nutrients of the milk except the milk sugar, and hence comes very nearly being a concentrated form of milk. Cheese made of skim milk has less fat, and hence relatively more protein.

Among the vegetable foods, the chief differences to notice are the proportions of water and of protein. The quantities of water range from 90 per cent or more in beets and turnips to as low as 10 per cent in some kinds of flour. In general, dry seeds, like wheat, corn, and beans, and the different kinds of flour and meal prepared from them, contain not far from one eighth water and seven eighths nutrients. Beans and peas contain the largest proportions of protein, and corn meal, potatoes, rice, turnips, and beets the least. Among the cereals wheat is the richest in protein. Doubtless this is one chief reason why it is so largely used for food. Oatmeal has rather more protein than wheat flour.

The comparison of wheat bread with wheat flour is interesting. The chief difference in the composition of flour and bread is the proportion of water, which makes about one eighth

the weight of flour and one third that of the bread. The average composition of wheat flour and the bakers' bread made from it is about as follows:

COMPARISON OF FLOUR AND BREAD.

| | Water. | Nutrients. | | | | | Fuel Value of 1 Pound. |
|---|---|---|---|---|---|---|---|
| | | Total. | Protein. | Fats. | Carbohydrates. | Mineral Matters. | |
| | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Per Cent. | Calories. |
| Wheat flour..... ..... | 12 | 88 | 12 | 1 | 74 | 1 | 1,640 |
| Bakers' bread..... .. | 32 | 68 | 9 | 8 | 50 | 1 | 1,300 |

In making the bread, a little butter or lard, salt, and yeast, and considerable water, either by itself or in milk, are added to the flour. The yeast causes carbohydrates (sugar, etc.) to ferment, yielding alcohol and carbonic acid in the form of gas, which makes the dough porous. In the baking, the alcohol is changed to vapor and the carbonic acid is expanded, making bread still more porous, and both are mostly driven off. Part of the water escapes with them. The amount of sugar and other carbohydrates lost by the fermentation is not very large, generally from 1½ to 2 per cent of the weight of the flour used. With increase in the proportion of water in the bread as compared with the flour the proportion of nutrients is diminished, but the addition of shortening and salts brings up the fat and minerals in the bread, so that the proportions are larger than in the flour. In practice 100 pounds of flour will make from 133 to 137 pounds of bread, an average being about 136 pounds.

Flour, such as is used by bakers, is now purchased in the Eastern States at not over $4 per barrel. This would make the cost of the flour in a pound of bread about 1½ cents. Allowing ½ cent for the shortening and salt, which is certainly very liberal, the materials for a pound of bread would cost not more than 2 cents. Of course there should be added to this the cost of labor, rent, interest on investment, expense of selling, etc., to make the actual cost to the baker.

Very few accurate weighings and analyses of bakers' bread have been made in this country, so far as I am aware, but the above statements represent the facts as nearly as I have been able to obtain them.

The average weight of a number of specimens of 10-cent loaves purchased in Middletown, Conn., was one and one quarter pounds. This makes the price to the consumer 8 cents per pound. The price of bread and the size of the loaf are practically the same now as when flour cost twice as much.

The cost of bakers' bread is a comparatively small matter to the person who only buys a loaf now and then, but in the Eastern States and in the larger towns throughout the country many people, and especially those with moderate incomes and the poor, buy their bread of the baker. Six cents a pound, or even half that amount, for the manufacture and distribution seems a very large amount.

In the large cities competition has made bread much cheaper, but even there the difference between the cost of bread to the well-to-do family who bake it themselves and to the family of the poor man who buys it of the baker is unfortunately large.

(*To be continued.*)

## INFECTION SPREAD BY BOOKS.

### THERE IS SOME DANGER OF THIS SORT, AND PRECAUTIONS SHOULD BE USED BY THE MANAGERS OF PUBLIC LIBRARIES.

THE question whether or not disease is disseminated by the books in public libraries is continually cropping up, and a renewed interest has just been given to the subject by the announcement that a librarian has died of tuberculosis contracted from books which had been infected by consumptive patients. But many points would have to be determined before the blame could be directly attributed to the books in this case.

Tuberculosis, as we now know, is, of course, a very infective malady, and some most remarkable instances have recently been recorded of its infectiveness, by means of the tubercle bacilli. But the general belief in scientific medical circles is that before the bacilli can take root in a healthy—that is, uninfected—person, there must be some predisposition to the disease derived by hereditary transmission. Thus the librarian who died of tuberculosis, contracted, as it is alleged, from the infected books, may have been a person who would have

become tuberculous in any case. His family history may have been one in which the hereditary taint of tuberculosis was strongly marked. Moreover, the sedentary nature of the occupation and the close confinement to ill-ventilated rooms probably contributed not a little to the accentuation of the family predisposition. Under these circumstances, then, any such person would be liable to contract the disease anywhere after exposure to the infection.

There is, however, one disease which undeniably can be disseminated by books, and that is scarlet-fever. The contagion of scarlet-fever has been transmitted in letters by post, and experience shows that its vitality is very great. A striking instance in which the disease was conveyed by a book may here be mentioned.

A surgeon performed an operation upon a lady in a bedroom at the top of his house. The case was quite successful —so much so that within a few hours after the operation the patient felt well enough to ask for something to read. The nurse looked about the room for a book or a newspaper, but, finding nothing of the kind, she opened a small cupboard by the side of the fireplace, and abstracted therefrom a yellow-backed novel, which she handed to the patient. The patient soon became absorbed in the volume, and continued on the following day to read it. Within forty-eight hours after the operation, however, her temperature suddenly rose, she began to become exceedingly ill, a deep red flush suffused the skin, and all the signs were present of an acute febrile attack. There could be no question that the case was one of scarlet-fever; the intensity of the attack at one time was such that the patient was in great peril of her life. But she ultimately made an excellent recovery, both from the operation and the scarlet-fever.

But whence had the infection been derived? Inquiry into the case clearly solved the mystery. Some six months before the bedroom where the operation had been performed had been a nursery, in which three children had been laid up with scarlet-fever. The room had been thoroughly fumigated, disinfected, and repapered; but in these necessary processes the little cupboard had been entirely forgotten. It had never been cleared out, and the rubbish it contained, together with

the novel, had been placed in it when the scarlet-fever patients had become sufficiently convalescent to be removed. Thus the rubbish and the book, contaminated with the contagion, had been left undisturbed until the nurse in the above operation case, some months afterward, abstracted the novel for the patient to read.

But while the possibility under certain circumstances of books being able to convey scarlet-fever poison is beyond dispute, there do not appear to be any well-authenticated cases in which the books of public libraries have been proved to be guilty of this crime. Indeed, the evidence so far in existence undeniably points in the opposite direction.

A medical man of large experience in Boston, United States, has stated that he has never known an instance where there were any grounds for believing that contagious diseases were carried by books in circulation in the Public Library. In the year 1872 a severe epidemic of small-pox prevailed in Boston, and the medical man in question saw every patient, and traced, where possible, the history. In no instance did he connect the infection with the use of books. As the circulation of this library is more than 2,000,000 volumes a year, the evidence is very convincing.

The American Library Association also has twice investigated the subject of books and contagion, and in no instance was it able to trace spread of disease to the circulation of library books. While, however, the evidence so far is negative upon this point, it goes without saying that proper precautions should be taken to disinfect books, or otherwise to deprive them of any infective properties upon every occasion in which they have been known to circulate in suspicious neighborhoods, and it would be well that by-laws should be framed refusing the issue of books to households in which infectious cases were ill. Again, it would be best that books read by scarlet-fever patients should never be allowed to reach the hands of healthy persons. The proper place for such books, after their purpose had been served, would be the fire, where it would be certain that their disinfection would be properly consummated.—*Westminster Gazette.*

# THE DISPOSAL OF WASTE IN COUNTRY PLACES.

By HARVEY B. BAYSHORE, M.D., West Fairview, Pa.

THE disposal of waste in country places presents a feature entirely different from that of a city, inasmuch as in the country this duty depends upon individual effort; and individual effort, be it ever so good, is a poor substitute for municipal oversight, where water-carriage, garbage-disposal, plumbing, and every other sanitary requirement must conform to definite rules.

First, in order, and perhaps, too, in importance, comes the disposal of human excreta, and this, in the absence of water service, is very important; for we have learned that one of the most common causes of preventable diseases in the country comes from well water polluted by seepage from cesspools and sunken privies, the kind of privies that are of almost universal use in country towns, and those commonly pertaining to country dwellings. Such privies should be absolutely abolished, unless they are placed far from any well, made perfectly water-tight, and frequently emptied. Instead of privies for the storage of filth—ever liable to dangerous seepage into the soil, well, and water-courses—dry earth-closets should be used. Perhaps better say ash-closets, for sifted coal ashes make the very best kind of absorbent, a quart or so being sufficient at each time of use. In this manner we have, too, a method of utilizing the ashes. The closet-pail should be emptied at least once a week, and placed in the sun for several hours. The refuse should be kept in some dry place and carted away from time to time for use as fertilizer. Ash-closets, when given a little care, are odorless and cleanly, and a safe method of disposal.

Urine, wash, and kitchen waters are best gotten rid of by some system of irrigation, either subsoil or surface. Preferably by surface irrigation, as being less trouble, less expensive, and perhaps the most efficient method.

A small vegetable bed, about twenty by twenty-four feet, for a family of three or four is all that is required. The slop

receiver can be placed at the corner of the bed, or at an out-of-the-way corner of the house, fitted with pipes leading to the bed, which should be laid out in furrows. In the summer the furrows can be arranged between the rows of vegetables, so as not in the least to interfere with cleanly cultivation. In the winter the water must be poured into the receptacle only at intervals, and then in sufficient quantity to completely flush the pipes, otherwise freezing would follow and greatly interfere with the workings of the system.

This area, though small, will effectually dispose of an amount of waste water very surprising and without any odor arising therefrom. The only work required is occasional raking and renewing the furrows.

In surface irrigation sunlight and oxygen are the great prejudicial factors to the growth of pathogenic and saprophytic bacteria, and the organisms of Schlössing, Müntz, and Warrington soon change the filth into ammonia and nitrates.

There is no danger of well infection by disposal of liquid in this manner, unless the land slopes directly to the well, for the filth is effectually disposed of in the surface soil.

I have in mind a piece of land used for this purpose during the last summer, within twenty feet of a well. That the well did not suffer, it is only necessary to state that the water showed only 1.1 part of chlorine per 100,000; purer, indeed, than any well water in the district.

Subsoil irrigation is also a very good method of slop-water disposal. The receptacle can be placed at any convenient place, as for surface irrigation. The arrangement of the bed is very simple. Lay agricultural drain tiles about ten inches below the surface, radiating from the point of departure under the bed in fan form, the end pipes all coming to the surface so as to allow the free circulation of air. A flush tank, of course, can be used, but this unnecessarily complicates the plant. In the country houses of the wealthy water service is generally used, and with it comes the question of sewage disposal into a cesspool. Instead of a cesspool a small shallow tank should be built in a convenient location, several hundred feet from the house, at the edge of some cultivated field. The house sewer should have pipes connected with this tank. An automatic flush tank with pipe connection suitably arranged

distributes the sewage over the land appropriated to the purpose. For the small amount of sewage furnished by one family no special preparation of the soil is necessary, save that it has suitable fall and drainage. My idea would be to cultivate corn on such a field in preference to grain or vegetables, for in a corn-field the soil is more exposed to sunlight than in the thickly covered grain field.

Sweepings and the solid refuse from the kitchen make another chapter in waste disposal, and for these fire is the best method. The kitchen range generally answers for this purpose, but sometimes there is a little odor, and for that reason some form of out-of door furnace is desirable. A very efficient one can be put up on the corner of the garden bed by making a fireplace of bricks, about three feet square, open at one side. If this is covered on the top with a piece of sheet iron and a stove-pipe inserted, we will have a very efficient furnace. A grate of any sort can be placed in it about six inches above the ground, to be used as a receptacle for the refuse, which can be burned every few days.

Ashes, broken crockery, and such waste should be kept in a heap and removed every few months for filling. If an ash-closet is used, almost the entire amount of this material will be disposed of in that manner. It will be observed that the general trend of individual disposal in the country is simply the ideal methods of city disposal in miniature, and gives the best results yet attained.

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CORK PAVEMENT.—A writer in the *Boston Medical and Surgical Journal* calls attention to the advantages of cork for street paving purposes. The material used is granulated cork mixed with mineral asphalt and other cohesive ingredients. It is then compressed into large blocks, and these blocks are imbedded in tar and rest upon a concrete basis six inches thick. The advantages claimed for this sort of pavement are cleanliness, noiselessness, durability, elasticity, and moderate cost. Unlike wood, being non-absorbent, it is not malodorous. It has been tested for several years in the cities and towns of Australia, and has given general satisfaction.

# THE MEDICAL ASPECT OF THE NICARAGUAN CANAL.*

By E. R. STITT, Passed Assistant Surgeon, United States Navy.

BEFORE entering upon the consideration of the subject proper, a few statements with regard to the proposed canal are necessary to a thorough understanding of that which is to follow: The length from ocean to ocean will be 169 miles; of this amount 26.8 miles will be excavated, 64 miles will follow the course of the San Juan River, Lake Nicaragua is to be followed for 56 miles, and the remaining distance is to be made suitable for purposes of navigation by means of dams flooding large depressed areas, which are termed basins, and of which there are to be two on the Atlantic side, the Deseado and San Francisco, and one on the Pacific side, the Tola. These basins are of great importance medically, as they will cover enormous areas, and, as a consequence, the least variation in the water level of the canal would expose vast tracts covered with decomposing organic matter. The extent of surface to be covered by these basins is at present unknown, no accurate determination of the flowage lines having been made.

Lake Nicaragua averages 100 feet above the sea level. This height it is proposed to increase 10 feet by an enormous dam across the San Juan River at Ochoa, 64 miles below the lake; as a result, the present height of the river at this point will be raised 50 feet, the effect of which will be to flood numberless square miles of territory, especially on the Costa Rican side of the river.

For convenience in the treatment of the subject, Nicaragua may be divided into two sections—that on the Atlantic Coast, of comparatively modern sedimentary formation, covered with extensive forests, swamps, and lagoons, with an excessive and practically constant rainfall—and that between the great lakes

* Abstract of report to Bureau of Medicine and Surgery, from Surgeon-General Tyon's Report to the Secretary of the Navy, 1895.

and the Pacific, the characteristics of which are more those of a temperate climate, formed of volcanic tufas and lavas, and having a far lower rainfall than the eastern side, with sharply defined wet and dry seasons. In addition, there is a third zone to the northeast of the lakes, mountainous in character, composed of rocks very old geologically, which is of great importance commercially as a coffee-raising district, but is of little interest in the present connection, being far removed from the line of the canal.

The climate and morbific conditions prevailing at Grey Town naturally take precedence in considering the eastern portion of the canal, not only by reason of its being the more important terminus of the work, but because it will undoubtedly prove to be the most healthy and suitable spot for the establishment of the general hospitals.

At first thought, when it is considered that the mean daily temperature at Grey Town rarely exceeds 80° or falls below 75° during any month in the year, and associated therewith is an exceedingly high relative humidity, it would appear that it was peculiarly suited to the development of yellow-fever. Upon investigation, however, we cannot find any record of this scourge having visited the place—reported epidemics having been simply pernicious fever of the hæmorrhagic type, with jaundice as a prominent symptom.

The question respecting this immunity naturally arises, and among the factors the following may be enumerated in the order of their importance :

1. The great regularity with which the northeast trade winds prevail, not only causing a constant change in the surrounding atmosphere, but likewise tending to nullify barometric changes by reason of the amount of moisture taken up in passage across the Caribbean Sea, and from the equalization of the temperature.

2. The soil conditions. This in itself is made up entirely of coarse sand and is exceedingly porous, as a result of which the heaviest rainfall is taken up with extraordinary rapidity, the surface in a few hours after a pouring rain becoming almost dry ; again, this factor of permeability lessens the amount of contained carbon dioxide in the ground air, which same is moreover checked in its movement by the small degree of

variation in the temperature and barometric observations. The practically uniform level of the ground water, by reason of the continuance of the rainfall during every month of the year, likewise has a favorable effect.

3. The absolute flatness of the site of Grey Town allows the winds to reach every part, and prevents any accumulation of miasmatic emanations, which would take place were there any depressions.

4. The degree and constancy of the rainfall making the absolute use of rain-water possible.

A knowledge of the disease and meteorological conditions of the eastern section can best be gained from the very accurate and complete hospital records of the Nicaraguan Canal Construction Company, of which a brief outline is as follows: From November 1st, 1889, to December 31st, 1890, 1669 patients were treated—1347 were medical and 322 surgical cases. Of this number, 1646 were discharged cured, and 23 died, giving a mortality of 1.3 per cent. Upon investigating the causes of these deaths, it was found that 5 were due to accidents or chronic diseases, 6 to diseases existing prior to entering the service of the company, and 12 to climatic factors.

In examining the case records of 831 patients as to character of disease, it was noted that in this respect there was a greater resemblance to the diseases of temperate than of tropical climates, thus:

| | |
|---|---|
| Remittent-fever | 203 |
| Intermittent-fever | 433 |
| Pernicious fever | 6 |
| Bronchitis | 65 |
| Cholerine | 19 |
| Pneumonia | 17 |
| Dysentery | 47 |
| Indolent ulcer | 38 |
| Phthisis | 3 |

As regards these diseases, it was found that the cases of pernicious fever generally supervened after prolonged debauch; the other forms of paroxysmal fevers were generally mild and most amenable to treatment, the remittent type disappearing, as a rule, in from four to five days. As will be

seen by reference to Appendix F, these diseases were most prevalent during the month of August.

Dysentery was the disease which appeared to cause the greatest anxiety with regard to a favorable termination. The month of September gave the smallest number of such cases. Bronchitis and pneumonia were generally mild in character.

The statistics showed that the amount of sickness was about 7 per cent greater when the rainfall was heavy. This is further evidenced by the fact that during the week from April 30th to May 8th, 1892, when was noted the extraordinary rainfall of 35.42 inches, there was a great increase of sickness.

In the summer of 1890, among the persons arriving from Colon, several cases of Chagres fever were discovered. Some of those affected were admitted to the hospital at Grey Town, and of these all recovered, while of those who chose to return to the Isthmus all died.

During the period from December 31st, 1890, to December 31st, 1891, 532 patients were treated in the hospital, with a mortality of 1.87 per cent.

The causes of death were as follows: Accidents, 4; tertiary syphilis, 1; algid form of pernicious fever, 1; icteric form of pernicious fever, 2; pneumonia (lobar), 2. It will thus be seen that only 0.93 per cent died from causes incident to climate.

Regarding the important question of susceptibility of different nationalities to climatic diseases, the statistics show that the proportion between diseases due to other influences and those incident to climatic factors was as follows: Jamaicans as 1 to 5; Americans as 1 to 8; Nicaraguans as 1 to 7; the inhabitants of 24 other countries as 1 to 6.

This apparent greater immunity possessed by the Jamaican negro is more probably due to his aversion to labor rather than to the lack of so-called acclimation in the European; the latter, by reason of greater exertion and subsequent fatigue, induces greater susceptibility, to which may be added the failure of this class of workmen to adapt themselves to the mode of living suited to a tropical country. Of course, in case the morbific cause were yellow-fever, the comparative immunity enjoyed by the blacks would be greater.

Of greater importance is the problem of a pure water sup-

ply. No adequate provision having been made for the collection and storage of rain water by the canal company, it was found necessary at times, when the amount of precipitation was slight, to resort to other sources. The water of a surface well, in the vicinity of contaminating factors, on the Grey Town side of the canal, when examined chemically gave the following result: Organic matter and nitrates, in large quantity; nitrates, sulphates, and sulphides, traces; inorganic residue, considerable; infusoria likewise present. This water had to be abandoned immediately by reason of its proving a fruitful source of disease.

A well sunk on the other side of the canal, at quite a distance from sources of contamination, upon chemical examination of its water gave the following as the qualitative analysis: Organic matter and nitrates, none; sodium chloride, in small amount; sulphates, traces; sulphides, none; magnesia, present. This water when used did not give any bad results. Notwithstanding this, however, it is fair to assume that were there contaminating factors located in the vicinity, this water would be as impure as the other. As a matter of fact the surface water of Grey Town is found to be most productive of enteric trouble, and in consequence is regarded as suspicious and avoided by the inhabitants.

In case of necessity water could be brought from the Deseado River, a chemical examination of which is as follows: Organic matter, present; nitrites, traces; nitrates, sulphates, and sulphides, none. The use of this water gave no bad results, but it will be a serious question regarding its quality when the canal excavation is entered upon.

The solution of the problem appears to be easy. With a catchment area of 100 by 50 feet, the loss by evaporation not being considered, there should be obtained about 2500 gallons per inch of rainfall, and as there is an annual rainfall at Grey Town of from 250 to 300 inches, as will be seen by reference to Appendix B, the supply would amount to about 700,000 gallons for the year, which, allowing 3 gallons to each person for drinking and cooking purposes, would suffice for about 600 employés.

The ration supplied by the canal company to the laborers is given in Appendix C. In addition, it was found that fruits

and vegetables were most important adjuncts to the regular dietary.

Passing over for the present further considerations involving the eastern section, the conditions pertaining to the western will be briefly treated. In this district we find that the annual rainfall for fourteen years has averaged 66.49 inches, or about four times less than on the Atlantic coast, being only 34 inches in 1885, while in 1893 it amounted to 105 inches.

The months from December to May are practically destitute of rain, as will be seen by reference to Appendix B, almost the entire rainfall taking place in the remaining months. From this it will be observed.that the rain appears to follow the sun ; when it is south of the equator the dry season prevails and *vice versa*. It will be further noticed that the heaviest rainfalls occur in June and October at the sun's zenith ; again when it is farthest north, in August, there is generally a slight period of dry weather, which is termed by the inhabitants *veranillo*.

It is of interest to note that the term *invierno*, meaning winter, is applied to that season extending from May to December, while the dry season from December to May is designated *verano*, or summer.

The winds, however, exercise a few more potent influences than the sun. Thus the northeast trade wind, which brings rain to the Atlantic coast, invariably brings dry weather on this side, its contained moisture having been precipitated by the hills of the eastern divide. The rare instances in which this wind coexisted with rain have had as explanation excessive rainfall at points east of Central America, as in Venezuela, the hills being unable to precipitate all the contained moisture.

An east or a southeast wind is generally accompanied by rain. The occurrence of rains during the dry season is frequently explained by a north wind, which, coming across the Gulf of Mexico, is moisture laden.

A wind from the southwest, which generally lasts from four to six days, then shifting to the northwest, produces the temporal, which is accompanied by rain. This wind frequently coincides with the solstices.

Some observers have noted that irregular winds are apt to prevail at the time of the equinoxes.

The diurnal maximum of the rainfall is almost invariably in the afternoon, commencing about 3 o'clock. At night the sky again becomes tranquil.

The extreme temperature ranges may be taken as 90° and 65°. Observations taken during the daytime rarely exceed 85° or fall below 75°.

The relative humidity is at all times, even during the dry season, exceedingly high, ranging generally between 89 and 93. As a result of these two meteorological conditions of constant temperature and high relative humidity, the barometric variations are very slight; consequently the aneroid barometer, with the weather indications on its face, is of no value in Nicaragua.

*Averages deduced from all observations taken at Grey Town, Nicaragua.*

| Month. | Temperature. | | | Total monthly rainfall. |
|---|---|---|---|---|
| | Mean daily. | Maximum. | Minimum. | |
| | ° | ° | ° | *Inches.* |
| January | 74.9 | 83.5 | 67 | 23.34 |
| February | 76.3 | 83 | 67.5 | 6.96 |
| March | 77.5 | 88 | 65 | 4.20 |
| April | 77.6 | 86.5 | 70 | 14.22 |
| May | 78.7 | 89 | 72 | 18.09 |
| June | 80.7 | 90 | 74 | 29.07 |
| July | 79.7 | 86 | 74 | 28.36 |
| August | 78.2 | 86 | 72 | 26.28 |
| September | 80.1 | 89.5 | 72 | 11.25 |
| October | 77.3 | 95 | 70.5 | 24.17 |
| November | 76.9 | 86 | 70.8 | 30.21 |
| December | 76 | 84 | 67.5 | 33.01 |
| Total annual rainfall | | | | 259.19 |

| | Inches. |
|---|---|
| Annual rainfall for 1890 | 296.94 |
| Annual rainfall for 1891 | 214.27 |
| Annual rainfall for 1892 | 291.20 |

Annual rainfall for 1893 only partially given.

As was the case on the eastern side, malarial affections here predominate. The pernicious form is, however, much more common than in the country surrounding Grey Town. The type is generally the hepatic one, and as jaundice and hæmatemesis are usually present, it is frequently mistaken for yellow-fever; and when it is considered that the mortality from this affection during the past two years has been about 75 per cent, it will be seen that there is little choice between the two. Then, again, there are exceedingly able diagnosticians, practitioners of many years' standing in Nicaragua, who maintain that this is yellow-fever and not malaria. These same, however, consider that yellow-fever is nothing more than a

virulent manifestation of poison, which loses the characteristics of paroxysmal fever almost in its incipiency, and believe that large doses of quinia prior to this transformation are equally as effective as in malarial-fever. Such a view being entirely at variance with that entertained by all authorities, it would seem probable that those who adhere to the malarial etiology of the disease are in the right. Another type of this form of malarial-fever, very rare and exceedingly fatal, is a tetanic one. At times only one limb or side is affected, while again the entire body may be thrown into violent tetanic convulsions.

The treatment adopted is that of large hypodermics of quinine; the hydrobromate is generally preferred. In some cases as much as 40 grains have been injected as a dose.

The remittent and intermittent fevers are, as a rule, mild and readily yield to treatment. Regarding the etiology, it is the consensus of opinion that drinking water has nothing to do with the production of paroxysmal fevers; the two factors which probably account for such manifestations are (1) the rise and fall in the lakes and rivers during the wet season, causing the surrounding low ground to be covered with decomposing organic matter alternately flooded and exposed; (2) the great change of level in the ground water during the wet season forces out the superincumbent ground air, which in its movement probably transports the causative micro-organisms.

Diseases of the kidney are very rare, the great activity of the skin emunctories being the apparent reason.

Typhoid-fever is almost unknown.

The uniform temperature and high relative humidity make this country most conducive to the cure of catarrh and pharyngitis

Phthisis is quite common, and the entire lake section of country is most inimical to the welfare of consumptives; consequently Nicaragua is not suited to the establishment of a sanitarium for such patients.

The affections of the liver most frequently observed are hyperæmia and tropical abscess, the latter generally due to repeated congestions or to dysentery; incision, with evacuation of the contained pus, is the usual treatment, aspiration not giving satisfactory results.

Syphilis, even when not treated or neglected, is of an exceedingly mild type, making its diagnosis most difficult by reason of the triviality of the symptoms. The disease, however, is quite common. Eczema accounts for 75 per cent of the skin diseases, which are very common. Tinea circinata is likewise frequently encountered, but yields readily to local application of tincture of iodine.

Enteric troubles are responsible for much of the sickness, and are frequently attributed to the ingestion of fruit in the latter part of the day.

It is of interest to note that here much larger doses of cathartics are required than in temperate climates for equal effect.

Greater misconception seems to prevail generally regarding the animal life of Nicaragua than of any other feature; therefore it seems essential to give a brief description of such agents as would affect the work of canal construction unfavorably. There exists an idea that the country teems with snakes, which are thought to constitute one of the chief dangers of a residence in this section. As a matter of fact, these reptiles are exceedingly rare, not more than six having been encountered by the canal commission in its survey of the canal route.

The principal venomous snakes are (1) the toboa, generally pronounced toboba; (2) the tamagas; (3) the coral snake.

There are about three varieties of the *Trigonocephalus*, the scientific name of the toboa. These are pit vipers, similar to the American rattlesnake, but without rattles. The dreaded *fer de lance* of Martinique and St. Lucia is the same type of snake. The toboa is quite large, from 4 to 7 feet in length, its fangs are intubated and vary in length from 1 to 3 inches, and are so strong that neither leather nor canvas would offer effective resistance to their penetration.

The tamagas is much smaller than the toboa, but far more ferocious and equally venomous, and is more dreaded by the natives than any other snake.

A great difference of opinion exists with respect to the venomous qualities of the coral snake. This is due to the fact that there are three or more varieties of snakes possessing colored annular bands; the ones with red and black bands alone are more apt to be poisonous than those which have

yellow bands or spots in addition. The non-venomous kind belong to the genus *Coronella;* the poisonous variety is possibly a venomous colubrine, the *Elaps.* Again, it is possible that an attack by this snake may be harmless at times, by reason of the narrowness of the mouth and the small size of its poison fangs.

The proportion of venomous to non-venomous snakes in Central America is as 1 to 8, in Africa as 1 to 5, while in North America it is as 1 to 14.

Regarding treatment, hypodermics of potassium permanganate are of doubtful value by reason of the difficulty of perserving the solution and attending delay. The best methods are (1) application of a ligature above the seat of the wound; (2) multiple incisions with subsequent cauterization; (3) administration of stimulants internally, especially ammonia.

Besides snakes the following are worthy of description:

*The nigua (or jigger).*—This is a species of flea, the scientific designation being *Dermatophilus* or *Rhynchoprion penetrans,* the impregnated female of which effects an entry beneath the skin of some portion of the foot, usually under the toe nail, and within about twenty-four hours becomes greatly distended with an immense number of eggs. Upon examining an affected toe a white spot about one fourth of an inch in diameter with a black point at its centre will be observed. The subjective symptoms are simply itching and soreness.

In removing the insect it is necessary to carefully dissect away the egg sac, otherwise the healing will be greatly delayed. This operation is best accomplished with a needle. A black speck in the centre of the mass is diagnostic.

After removal it is best to treat the wound antiseptically, because, if neglected, intractable ulcers ensue. These insignificant creatures have been the means of disabling many, and have in many instances been followed by tetanus and death.

*The bala (or alligator ant).*—This is a very large black ant, from $\frac{3}{4}$ to $1\frac{1}{4}$ inches in length, with very powerful mandibles capable of taking a firm hold, and possessing a terminal abdominal appendage, where is located the sting. In ferocity this insect is unequalled. It will attack a live coal and continue inserting its sting until dead. The sting is excessively painful, and instances are on record where persons have fainted

when bitten by four or five at the same time. Aqua ammoniæ relieves the pain.

*Mosquitoes.*—These pests are worse than those of the United States only by reason of their greater number. There exists, however, one variety the female of which deposits an egg beneath the skin, the egg subsequently developing into a worm, or gusano, as the natives term it, which, by reason of its deep penetration with the assistance of a boring apparatus, causes excruciating pain. They are speedily destroyed by sealing up the orifice which exists at the point of entrance with adhesive plaster or by the application of a tobacco compress.

Scorpions and lizards do not create any great alarm. The bite of the former is very painful, but not dangerous.

Gnats and species of horsefly are productive of great discomfort.

On the western side during the dry season ticks are abundant. The variety is the brown one (*Ixodes bovis*), varying in size from a pin-head to a pea. It is necessary to make nightly examinations of one's person during the period of their activity; the natives remove them with a piece of wax. They are liable to attack sick or weak animals, and if not directly fatal predispose to such result.

A question of considerable importance from a military standpoint is the probable effect upon the health of troops in expeditions undertaken with a view to defence along the route of the completed canal.

In an article on the climatic conditions of Nicaragua, the following statement is observed:

"The experiences of the employés of the Nicaragua Canal Construction Company is no criterion by which to judge of the probable effect of the climate upon a body of troops. It is impossible for a considerable military force to be maintained in the same state of health as this selected body of intelligent employés, whose conditions as regards not only food, clothing, and shelter (as well as their regular lives) are superior to those of troops, but whose qualities of healthfulness and prudence are also important adjuncts to health."

When it is considered that a very large proportion of the employés referred to above were Jamaican negroes and natives

of Central America, it is certainly a grave reflection upon American troops to place them on a lower plane of intelligence.

As regards food, clothing, and shelter there could be no comparison between the conditions that would pertain in connection with our troops over the aforementioned employés, because military discipline would enable the officers to enforce any regulation regarding such matters, while in a civil organization this is impossible.

Again, the employés of the Nicaragua Canal Company were exposed to the most unfavorable conditions as regarded exposure to rain, sun, etc., working in the swamps up to their waists in water for hours, not changing their clothing until night, even neglecting this precaution when so disposed. No equal fatigue from drill or exposure to such unfavorable climatic conditions would ever be sustained by troops except, possibly, for a short time when engaged in actual military operations. Furthermore, the medical force of the canal company were constantly requesting a medical examination prior to employment as a measure to prevent physical wrecks foisting themselves on the company.

The disastrous termination of the English expedition under Dalling and Nelson in 1780 is frequently advanced as an argument against the possibility of military operations in Nicaragua. It will be remembered that out of a naval force of 200 men Nelson brought back only 10, while the invading army suffered equally. It was said by Collingwood that the climate was deadly, and that no constitution could resist its effects. It must, however, be considered that quinine was not discovered until 1820, and that even if provided with cinchona bark the supply must have been of necessity limited, canoes having been the means of transportation ; and, furthermore, that in Nicaragua quinine is as necessary in the treatment of the fluxes as of malarial fevers, from which Dr. Mosely, in his work, " Tropical Diseases," states that the forces suffered. Likewise it is well known that scarcity of food and shoes, by reason of lack of communication with any base of supplies, contributed largely to the destruction of the party, and, when the lack of food in the country surrounding Castillo is considered, this was probably a more important factor than the climatic one.

This brings us naturally to a consideration of the hygienic measures which should be adopted in such a country, and first as regards shelter. When the first expedition was sent out by the canal company in 1887, tents were provided. These had no flooring, and as a result the mud in a short time was from 3 to 6 inches deep. Furthermore, the canvas soon mildewed and leaked, permitting the saturation of all bedding, etc. This caused the substitution of huts for tents, and a more perfect and satisfactory camp than one of this kind cannot be conceived. To describe such a hut, the rafters, etc., are bound to the upright posts and the whole made perfectly secure by means of an exceedingly tough and pliable vine which can be found everywhere. The leaves of the sweetie palm are used for thatching and make an absolutely watertight roof. To make a floor it is only necessary to split up the hollow trunk of the maquenge palm and lay the strips on logs. The beds are made from these same pieces secured by vines to supports which give a height of about 18 inches. Eight men could build a hut large enough for 50 men in one day, which would last from one to three years. There is not a single nail used in the construction.

In the second place, with reference to food conditions, the dietary given in Appendix C was found to be perfectly satisfactory by the canal company, and in this connection it seems only further necessary to insist upon a liberal allowance of fruits and vegetables. It is very probable that much of the dysentery so common in Central America is of scorbutic origin, many of the inhabitants living almost exclusively on meat and bread. Notwithstading the vast quantities of fruit at hand in most parts of Nicaragua, nothing is more difficult to obtain along the first 75 miles of the canal line than this.

Again, although the medical authorities of the country claim that trichinosis is rare, yet, after observing the filthy conditions under which hogs are here raised, it would seem advisable to avoid eating the meat for other reasons as well as this.

Now, thirdly, as to the proper clothing, the profuse perspiration attending even the slightest exertion necessarily makes wool the most appropriate fabric. Even those who deny this admit that for reasons of comfort woollen drawers and stockings are preferable.

The following outfit will give satisfaction and in addition will possess the merit of occupying a small compass: A grayish flannel shirt or a jersey of light color (no undershirt), flannel drawers, and woollen stockings.

The trousers should be of heavy canvas, this material offering less hold to ticks and being less liable to tear from the abundant thorns than other kinds. The shoes should possess heavy soles and broad toes. Narrow-toed shoes cause intolerable itching between the toes by reason of constant friction between the adjacent macerated surfaces. Boots, being liable to embarrass movement by reason of becoming full of water, are to be avoided. As a protection against snakes and thorns, heavy canvas leggings should be worn.

Upon the completion of the work of the day, a dry sleeping garment should be provided, preferably of wool. It is absolutely necessary to have rubber blankets in order to keep the bed clothing dry while undergoing transportation from one camp to another. Finally, regarding health measures, it is only necessary to call attention to the importance of bathing daily, which is best done immediately upon return to camp from work, while the body is still warm, then to put on dry clothing, and if whiskey is ever required it is at this time.

As evidence tending to prove that military expeditions would not be fraught with peril, the following instances may be presented:

During the exploring trip made by President Warner Miller in April, 1891, in which the number of the party was 80, many of whom were unaccustomed to the slightest hardship, there was no sickness, with the exception of a few cases of diarrhœa on the west side, due to change of drinking water. Again, during the years when the surveying parties were at work, the health of those employed was most excellent. Finally, during the entire tour of inspection of the canal route by the Nicaraguan Canal Commission, the exertion incident to a speedy performance of this duty, inducing at times the greatest fatigue, with a party numbering 40, there was not a single day lost during the six weeks by reason of sickness.

There now remain in connection with the canal two considerations: (1) As to the probable effect of the work of excavation and dam construction upon the health of the employés,

and (2) with regard to the influence of the completed canal upon the disease conditions of Nicaragua.

One of the advantages claimed for this canal route over the other proposed one is the good health enjoyed by its employés, notwithstanding the fact that such work as railroad construction and canal excavation, which had been so productive of disease and death in other Central American countries, had been undertaken. In a former paragraph the freedom from disease of exploring and surveying parties has been referred to, but in these instances there was no disturbance of the virgin soil to exercise a deleterious influence. It is a well-known fact that the surveying parties of both the Costa Rican Railway and the Panama Canal enjoyed exceptional health. The one to whom the construction of the railway is due states that during the years of survey there was scarcely any sickness; yet when the work of construction, necessitating overturning of the humus, was undertaken, disease became rampant, about 3000 sacrificing their lives to the construction of less than 20 miles.

The reason similar conditions have not obtained in the work done by the Nicaraguan Canal Construction Company is this: The 10 or 12 miles of completed railway is through a swampy section, and the method of work was the filling in with sand from the beach; there was scarcely any excavation, and most of that was through a clay comparatively destitute of organic matter.

The character of the soil of the one mile of canal excavation which has been accomplished is that of the sand on which Grey Town is located; the same conditions therefore naturally resulted as the dredging of a sand bar would have produced. When the work is pushed forward and the humus, so rich in organic matter, is exposed to the action of sun and air, the same conditions as were productive of such disastrous results on the Isthmus of Panama will probably manifest themselves here.

The immediate effect upon the healthfulness of the surrounding country, as a result of the construction of the canal, will probably be to greatly increase the amount of malarial disease by reason of the great quantity of organic matter which will be undergoing decomposition in the newly con-

structed dams and embankments. This will be but a temporary influence. The final result, however, will probably be beneficial, the covering with water of enormous areas which are now simply pestilential swamps and the maintenance of a uniform level of Lake Nicaragua eliminating two factors which are now most potent.

The only possibility of the completed work directly causing disease in the future would be in case excessive rainfall or seismic forces should destroy or injure the dams, allowing the water to run off and leave exposed the vast tracts artificially covered.

## THE TURKISH BATH.

By Louis Lewis, M.D., Philadelphia.

Whoever indulges in a Turkish bath for the first time will be astounded at the vast amount of dead tissues and used-up bodily products that are expressed from his skin by the combined action of the hot air and massage. Countless rolls of effete material, that cannot be removed through the medium of ordinary perspiration, make their exit through the surface, by channels that were previously blocked and impervious. Simple perspiration—the first effect of the hot-air bath—acts on the smaller sweat-glands, and sets free the water, carbonic acid, and more or less nitrogen ; but the larger sweat-glands, which are situated in the fatty tissues beneath the true skin, and contain the solid constituents lactates acetates, lime-salts, chloride of sodium, besides various extraneous matters present under unhealthy conditions are only acted on by the addition of scientific hand-kneading. The retention of these extraneous matters, urea, uric acid, acetone, bile-products, etc., leads to toxemic headaches, erythematous swellings, rheumatism, gout, and jaundice. Another system of glands, the sebaceous or oil-glands, are also apt to become blocked ; and their imprisoned tallowy contents—olein, stearin, palmitin—give rise to unsightly varieties of acne on the face, chest, and shoulders. But these glands are nearer the surface than the sweat-glands, and thus are more readily relieved of their contents. The sweat-glands also contain some fatty matter, similar to, but not identical with the contents of the sebaceous

glands. The exit of sweat results partly from increased blood-supply, but more from reflex action in the sweat-centres, kindled through the medium of the nerve fibres.

No sensible person can doubt the expediency of ousting all these intruders from the system, by a method so agreeable and effectual as the Turkish bath. Then comes a sensation of relief from some indefinable general obstruction, as though one were actually breathing through every portion of the body, and a feeling of buoyancy only comparable to "walking on air." A little muscular languor may remain, which, however, is not fatigue, yet invites one to indolent repose on a couch provided for the purpose; and after a short dreamy period, devoted to "thinking of nothing at all" (like the jolly young waterman), one rises as a "giant refreshed."

Numerous minor ailments and functional disorders are removed or ameliorated by the Turkish bath. The expectoration, hoarseness, and oppression of breathing, attendant on "taking cold," are speedily relieved, also the lassitude and aching of limbs. In febrile conditions, it is necessary to restore the balance between oxidation and nutrition, or, in other words, between the production of heat and its consumption; here the bath affords a rational remedy, by reducing and regulating the temperature. Heat is a source of motion in the animal body, and must not be unnecessarily wasted. Residents of cities, who lead sedentary lives, and take insufficient exercise in proportion to a free mode of living, are liable to a general plethoric condition, marked by a coated tongue, florid face, suffused eyes, and bounding pulse; or the blood itself may be tainted with retained excrementitious material, as signalized by a moist tongue, pallid face, sallow skin, and depraved secretions. A regular use of the Turkish bath will go far to control the blood-supply, and, by removing the offending matter, restore the various organs to their normal state. The bath is very useful in neurasthenia, with a dry tongue, wayward appetite, disordered vision, tinnitus aurium, and headache; and in vertigo, even when the dizziness affects the gait, and causes a dread of walking alone. The bath tranquilizes the vital condition of all the nervous centres. Many persons are worried by morbid "thick-coming fancies" that trouble the brain and weigh upon the heart; these are com-

monly called "a fit of the blues" or "the vapors," and they are quickly exorcised by the Turkish bath. Chronic sleeplessness, whether due to rheumatic, gouty or dyspeptic disorders, yields to a course of baths, through the depurative effect of free transpiration and the functional activity that is awakened by the massage. Headaches of nervous and congestive origin and those due to the toxemic influence of urea, bile, alcohol, and malaria, succumb to this agent, when timely employed. Spinal irritation, rheumatism, lumbago, and sciatica, asthma, chronic bronchitis, and winter cough, irregular work of the kidneys and liver, are all alleviated by hot air and massage. Eczema, psoriasis, urticaria, prurigo, and other skin diseases are benefited; but for obvious reasons these are unsuited for treatment in public establishments. In fine, in any of the other conditions alluded to and in many functional disturbances outside of organic change, I would say to the patient, without discrimination seriously and literally, "Go to bath," and let it be a Turkish one.—*The Times and Register.*

## THE SONG OF THE MICROBES.

"I SEE that you had the cheek to print what you and I talked about the other day," said the critic as he strode into the scribe's den.

"Yes, it was thought to be worth pushing along."

"Well," replied the critic, as he settled in an arm-chair and planted his muddy feet in a pile of fresh exchanges, "it is too rainy for our spin about town to-day, so I have brought you something to fill up—"

"My dear boy, do you know," replied the scribe, "that there is never any difficulty in 'filling up' as you call it? The real trouble comes when the editor has to determine what to leave out so as to get what must 'go' in."

"You don't say?"

"What have you there?"

"A poem."

"Why, it is not spring yet?"

"So? You know Tom Fitch, the silver-tongued? Yes? Well, he married Mrs. A. M. Shultz, a gifted woman. Once on a time she wrote 'The Song of the Flume.' It goes like this:

"'Awake! awake! for the flaming east
Is red with the coming day;
My struggling breast disdains its rest,
And I haste o'er the hills away.
Up from the valley! Up from the plain!
Up from the river's side!
For I come with a gush, and a torrent's rush,
And there's wealth in my swelling tide.'

"Fine, isn't it?"

"Oh, yes; it is a California classic—is that song."

"Well, I was down to see the big water in the river this morning, and as I noted that the trustees have bought a strip of land recently on which to plant another pump to bring in more of the river water for the people to drink, and as I saw the nastiness floating in the turgid tide of the stream, Mrs. Fitch-Shultz's poem came into my head, and I went into a corner joint and scratched off this parody."

"Leave it, and I will determine."

"Well, if you use it, entitle it 'The Song of the Microbes,' and dedicate it to the city dads," and the critic shook out his umbrella and strode off into the storm.

"Awake! awake! for the flaming west
Is red with the coming day;
Our 'bacterial' breasts disdain their rest,
And we haste down the stream away.
Up from the valley! Up from the plain!
Up from the river's side,
Here we come with a gush and 'microbean' rush,
And there's death in our 'bacillean' tide.

"We are fed by the 'zooidic' rills that start
Where deadly 'spirillum' gleam;
Our course is free, and with greatest glee,
We breed in the sun's broad beam.
Though torn from cesspools deep and old,
And the dank fermentations still,
Yet as 'schizomycetes' we glide,
And there's death in our 'vibro' thrill.

"We seek the shore of the 'zymotic' stream
By the city's water main;
With 'myconostoc' crews and 'zymic' thews,
We dance in the river's stain.
We are sucked up in a winding way,
Are fettered in pipes like slaves,
And as serfs of old we're sold for gold,
So they barter our 'cplenic' waves.

"Through the dim main, down the dark pipe,
Shot to the hydrant gate,
We break away to the light of day,
To enter on our new-born fate—
Fever and pain, peccant 'ptomaine'——
Breed them with eager haste,
For our "bacilli' shower is sold by the hour,
And the drops are too dear to waste.

"Into the stomach of youth and age—
Fathom the maid's blue vein;
We'll search the red blood for life's chief food
Ere we sink to the river again.
With 'contagia'—'zymotic' disease—
Bacillus anthracis—
Though they brave our strength, we triumph at length,
And health the 'zooid' doth kiss.

"Ours is no stern and warrior march,
Nor stormy trump and drum;
Our banners tule rot and prison pot,
Festering flesh and sewage scum.
We infect the robust, smite the strong,
Till they own a monarch's sway,
As with 'sporic' hand, from a conquered land,
We bear their health away.

"Mourn! mourn the dead, O! ye loving hearts!
Follow still the funeral car;
There are tearful eyes in the homes you prize,
And men pity you from afar.
But what care we, 'Leptothrix' so free
From slough and drain and dumps;
For we come with a fœtid gush, and torrent's rush
To feed the city's microbe pumps."

—*Sacramento Union.*

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SUGGESTIVE STATISTICS OF THE DEPENDENT CLASSES.—Hon. W. P. Letchworth, for many years member of the New York State Board of Charities, and who has devoted much of his time to the study of means for ameliorating the condition of the dependent classes, observes, in a recent interview (Buffalo *Courier*, February 6th, 1896), that:

"It is a curious and suggestive fact that while the number of men has gradually increased in the poorhouses, the number of women has steadily decreased. The whole number of inmates in the poorhouses in the Eighth Judicial District, comprehending the counties of Alleghany, Cattaraugus, Chau-

tauqua, Erie, Genesee, Niagara, Orleans, and Wyoming, at the time of my last general inspection, was 1228. Of this number 801 were men and 375 were women. There were 689 males in the poorhouses in 1869 as against 871 in 1895, and 537 females in 1869 as against 357 in 1895. The removal of the insane from the poorhouses since 1869 does not materially affect the comparison, as the number of insane men and women in these institutions in this district were about the same."

He attributes this difference to the increased avenues open to women for profitable employment and the larger use of spirituous liquors and tobacco by men. Moreover, women who become enfeebled and dependent often find a refuge in the families of relatives or friends, where they can, by looking after the children or doing some light work, very greatly lessen or entirely meet the expense of their support. When a man's infirmities or disability drive him from the field or the workshop to the house there is but little, if anything, that he can do to aid in his support; and if his dependency is caused by habits of dissipation, he usually becomes a nuisance in the family home, and at length finds his way to the poorhouse.

"In the great city almshouses of New York and Brooklyn there continues to be a greater number of women than men, and the relative increase is slightly greater. In 1869 the males in the New York City and Brooklyn almshouses numbered 3770 and the females 3856, including the insane; in 1895 the males numbered 7785 and the females 8070, including the insane. A certain class of women in these cities are exposed to greater temptations and lead more dissolute lives than any class of women in the country; and while the opportunities for the employment of women are greater in these cities, the compensation is often at starvation rates. The greater number of liquor saloons in the cities are a constant temptation to the head of the family to spend his earnings and thus pauperize the wife, who goes to the almshouse when she can no longer bear the strain, while the children go to the orphan asylum. Not an infrequent factor in the demoralization of the female sex in New York and Brooklyn is the abominable tenement-house system, under which it would seem impossible to rear young girls in ways of purity and chastity.

"There is no doubt that the large number of paupers in the New York City and Brooklyn almshouses may be largely accounted for by immigration, which leaves at the seaboard those verging upon dependency, while the hardy and independent with more means push westward; but this will not account for the preponderance of women over men in these institutions."

# THE GEOGRAPHICAL DISTRIBUTION OF THE MINERAL SPRINGS OF THE UNITED STATES.*

By A. C. PEALE, M.D., Washington, D. C.

"WATER cures gout and hypochondriac melancholy; it benefits gravel and stone in the bladder; it makes the child grow strong in the womb, and increases the mother's milk; it stays hunger, for there was a certain crack-brained man who, at Leyden, when Dr. Carr resided in that university, pretended he could fast as long as Christ did, and it was found that he held out the term of forty days without eating any food, only he drank water and smoked tobacco." "Water is also of great use to strengthen weak children; it prevents swelling from bruises, sickness of the stomach, shortness of breath, and vomiting; it cures fluxes, consumption, flushes, colic, small-pox, etc."

This, gentlemen, is not a quotation from one of our modern mineral spring circulars, but an extract from a work nearly two hundred years old, entitled "The Curiosities of Common Water; or, the Advantages thereof in Curing Cholera, Intemperance, and other Maladies," by John Smith, C.M. It was reprinted at Boston, Mass., from the London edition of 1712, for Joseph Edwards, at the corner shop on the north side of Town House, in 1725.

Had a map of our mineral springs been prepared when this was written, or when it was republished at Boston, the High Rock Spring of Saratoga, some of the springs at Ballston, N. Y., the Warm Springs of Virginia, the Sweet Springs of the same State, the Greenbrier White Sulphur Springs, and Berkeley Springs, then called Bath, might have been cited, although none of them was at all improved or used as a resort until the time of the Revolution or later. Had the map been made in 1831, after Dr. John Bell published his "Baths and Mineral Waters," the springs named above would not be so few in number, for some fifteen other springs would probably have been added to the number, but nearly all of these would have been in the Appalachian region, mainly in Virginia, New

* Read at the meeting of the American Climatological Association, at Hot Springs, Va., June 14th, 1895: *Transactions.*

York, and Pennsylvania, with a few in North Carolina and Kentucky, and one in Arkansas— the celebrated Hot Springs, then known as Washetaw Springs. If we have not made any striking advance in the claims of our mineral water literature, as shown in most of the mineral spring circulars of to-day, we have certainly advanced in the knowledge of the location of our mineral springs. I have recently compiled for the United States Geological Survey two maps, one showing the distribution of some 330 springs, whose waters are put upon the market to the amount of more than 20,000,000 gallons annually, with a valuation between $4,000,000 and $5,000,000. Upon the other map I have plotted nearly 700 mineral springs which have become resorts.

The map of those springs whose waters are used commercially shows at the first glance that the majority of such springs are found in the Eastern United States and in the Mississippi Valley. West of the one hundred and first meridian they are largely confined to the Pacific coast. In Idaho, Colorado, New Mexico, and Montana we find, altogether, barely a dozen springs so used. This is not because the total number of springs in the East is so much greater than in the West, but it is mainly because the former region has the greater population, and consequently that which is true in many other respects is also true in the matter of mineral waters—that its resources in that direction are more thoroughly developed and utilized than is the case in the West.

The map of the "Mineral Springs Resorts" presents a much larger total number of springs, and shows also a more equable distribution over the country, for many of our most improved and best-known resorts are found in the middle West and in the Rocky Mountain region, and in no respect do they suffer in comparison with those in the East or with those on the Pacific coast. Thus a map giving all the springs would have some plotted within the borders of every State.

Another glance at the map would show that our thermal springs lie mainly in the West. The States west of the one hundred and first meridian include a little more than 39 per cent of the total area of the country, and yet they contain more than 80 per cent of its known thermal springs.

The thermal quality of a spring depends largely upon its

geological position. Professor W. B. Rogers pointed out many years ago the connection between the warm springs of Virginia and the faults and anticlinal axes of the Appalachian Mountains. In almost every country a connection between thermal springs and mountain ranges is readily recognized, and just as apparent is the connection, the world over, between hot or warm springs and the occurrence of volcanic rocks. In the Rocky Mountain region and other parts of the Far West, in addition to the mountainous character of the country, which is of recent origin compared with the Appalachian section, we have also a region of more recent volcanic disturbance, and one in which rocks of igneous or eruptive origin frequently cover extensive areas. As already stated, the hot and warm springs of Virginia and the warm springs of North Carolina and Georgia are found within the limits of the Appalachian folds, and the Arkansas hot springs are found in connection with the Ozark Mountain uplift.

Inasmuch as mineral waters derive their solid constituents from the rocks through which they pass on their way down and up before they emerge as springs, in this respect also they must be very dependent upon the geological structure of the country. With this in mind, a comparison of the geological map of the United States with a map of its mineral springs is very instructive. In regions where the older or metamorphic rocks constitute the surface formation, or are near to it, as a rule the waters contain a much smaller percentage of mineral matter than in those regions where, in order to reach the surface, the water must pass through sedimentary rocks, which, on account of their structure, are more readily affected by the solvent powers of the water.

It has frequently been stated that thermal waters are less highly mineralized than non-thermal waters. *Apriori*, hot water is a better solvent than cold water; therefore if sometimes a thermal water is less highly mineralized, it is probably because it comes from a greater depth, where the rocks are of such a character as to be less readily acted upon. Other things being equal, there is no reason why a thermal water should not contain the same ingredients as a non-thermal water; and, as a matter of fact, where the two occur in the same locality, coming through the same rocks, the difference

in quantity is in favor of the thermal water. Here in Virginia, for instance, at the Hot Springs, one of the springs, with a temperature of 78° F., has 18.09 grains per gallon of solid contents, while another, with a temperature of 110° F., has 33.36 grains per gallon; and at the California geysers the coldest spring, with a temperature of 70° F., has 7.12 grains per gallon, and the hottest, at 212° F., contains 296.4 grains per gallon.

So far as the general geological features of the North Atlantic States, including those from Maine to Pennsylvania, are concerned they might be divided into the sections so long recognized in our older school geographies—viz., the New England and the Middle States. In the former the older rocks form a large part of the surface, which accounts for the fact that, as a rule, the mineral springs of that section are somewhat less highly mineralized than are those of the Middle States. The springs of Maine are slightly alkaline-saline and chalybeate. In Vermont the conditions are much the same, except that sulphuretted springs are more numerous. Connecticut, Rhode Island, and Massachusetts are not remarkable for their mineral springs, though chalybeate springs are common in all. Many of the mineral springs of the New England States are utilized commercially for medical purposes and table-waters, and also as places of resort.

In the Middle States a much larger number of springs is found, and a larger proportion of the waters is utilized, both commercially and as places of resort. Saratoga is the prototype of all other mineral-spring resorts throughout the entire Union. In the Oak Orchard Spring New York has also one of the most celebrated acid springs of the country, while Richfield Springs, Avon Springs, and the Deep Rock Spring are well known far beyond the State limits. In Pennsylvania Bedford Springs is one of the oldest resorts, while Cresson Springs, Gettysburg Katalysine Spring, and many others are well known. In New York and Pennsylvania, as well as in New Jersey, chalybeate springs outnumber all others. In New Jersey the best-known resort is the Schooley Mountain Spring, a chalybeate spring that has been utilized for many years.

In their geological features the South Atlantic States are

not unlike the Middle States, and naturally the springs also are of the same general character. Thermal springs are, however, more numerous, being found not only in Virginia and West Virginia, but also in North Carolina and Georgia, as well as in Florida, where all the springs are slightly thermal and nearly all are sulphuretted. The flow from some of the Florida springs is sufficient in volume to float steamboats of considerable size. Maryland has a fair number of resorts and several well-known waters which are used for commercial purposes. Virginia is, *par excellence*, the mineral-spring State of the section, occupying among the South Atlantic States the same position that New York does in the North Atlantic section; indeed, it is second only to that State in the number of springs that are utilized commercially, and exceeds it in the number of its resorts. The Hot Springs of Virginia are among the most celebrated in the country. West Virginia is equally noted for its springs, having two of the oldest resorts in the United States in Berkeley Springs, at Bath, and the Greenbrier White Sulphur Springs. The general character of the springs in Virginia and West Virginia is the same, saline sulphuretted waters being most numerous, although alkaline, chalybeate, and acid springs are found, both hot and cold. The springs of North Carolina, South Carolina, and Georgia are much like those of the Virginias, and each State has resorts of national as well as local reputation.

The South-Central States include Kentucky, Tennessee, Alabama, Mississippi, Louisiana, Texas, Indian Territory, Arkansas, and Oklahoma. In this section of the country the saline springs outnumber all others, while thermal springs are relatively few. Though a large part of the area is occupied by comparatively recent geological formations, yet in the northern and western portions carboniferous rocks, with the underlying formations, are well developed, and they are usually prolific of mineral waters. Tennessee, Kentucky, Arkansas, and Texas are the important mineral-water States of the section. The Hot Springs of Arkansas occupy a first place among the thermal waters not only of that State, but of the entire country. The springs of Kentucky and Tennessee have had considerable attention paid to them by geologists and chemists, and they have many improved resorts. The

Blue Lick Springs are well known. Texas is noted for its springs, among which are a number of acid springs containing free sulphuric acid, and many hot springs in the western part of the State. In Alabama, Mississippi, Louisiana, and Indian Territory there are numerous mineral springs, but apparently they have had little attention paid to them, and we find that fewer have been improved there than in the other States of the section.

The north-central section includes the States from Ohio westward to Missouri and Nebraska, and northward from the Ohio River to the Canadian line. Here the geological conditions are similar to those of the South-Central States, and in both sections saline-chalybeate and calcic waters are abundant, many of them being highly sulphuretted. In Ohio calcic springs probably predominate. The springs of Indiana and Illinois are much the same as those of Ohio. Missouri is a State rich in mineral springs, the Sweet Springs of Saline County being perhaps the best known. The mineral waters of Kansas are drawn mainly from artesian borings, as are those of Michigan also. In both States the waters are well mineralized, sulphuretted saline springs predominating. In the northern part of the north-central section, where there are large areas containing metamorphic surface rock, the springs are like those of the New England States in their general character, not being as a rule very highly mineralized. The Waukesha springs have a widespread reputation, and Wisconsin stands at the head of the list in the number of gallons of water sold from her springs. The springs of Minnesota and Iowa are much like those of Wisconsin, calcic, alkaline, and chalybeate springs being most prominent. The occurrence of acid springs in Iowa is interesting. Dakota has the one thermal spring of the section in the "Dakota Hot Springs" of South Dakota.

The Western States include the Rocky Mountain region and the Pacific coast, with the intervening Great Basin and Plateau region. As already stated, thermal springs are most numerous in this section. California stands at the head so far as the improvement of the springs is concerned, both in respect to the number used as resorts and those whose waters are used commercially. Its mineral waters are of all kinds,

and they are not confined to any one section, but are found from one end of the State to the other. With the exception of Wyoming, which includes the Yellowstone National Park, California contains a greater number of mineral springs than any other State.

The Yellowstone Park is, of course, the greatest resort in the United States, and it is deservedly so, not only on account of the presence of its geysers, but also because of the great variety in its springs; when they are better known they will undoubtedly be more highly prized for their medicinal virtues than they are now.

Although there are nearly four thousand springs and one hundred geysers in the National Park, less than one hundred of these springs have had a careful analysis made of their waters. The springs are of course nearly all thermal, and may be classed under three heads—viz., (1) calcareous waters, which are generally carbonated to a slight degree, and sometimes are sulphuretted; (2) silicious waters, that are acid, carrying free acid in solution; and (3) alkaline waters, also silicious. Nearly all the springs carry arsenic, varying in quantity from .02 to .25 per cent of the mineral matter in solution. The waters of one locality in the park are compared by Mr. Arnold Hague to those of the famous sanitarium of "La Bourboule" in France, which has achieved a wide reputation for the efficacy of its water in nervous diseases.

Colorado, sometimes called the Switzerland of America, has had considerable attention devoted to its springs, and there are now many well-known resorts within the limits of the State, of which perhaps Manitou, near Colorado Springs, is most widely known. A number of the waters are used commercially. Both hot and cold springs are found; many are alkaline, others are chalybeate, and saline springs are numerous. They are sulphuretted and carbonated in many cases.

In Arizona and New Mexico alkaline and saline waters, a large number of them carbonated and sulphuretted, are so numerous that they attract but little attention. They are even more common in some places than springs of pure water. Several springs in New Mexico are utilized for commercial purposes, and Las Vegas Springs is one of the finest mineral-spring resorts in the country. Utah and Idaho both have

many well-developed springs. In the former the hot springs at Ogden and at Salt Lake City may be mentioned, and in Idaho, Hailey's Hot Springs and the Soda Springs of Bear River are best known. From the latter comes the Idaho natural mineral water, which is largely sold in the middle West.

Most of Montana's springs are thermal, and they are alkaline, saline, chalybeate, and calcic. Many of them are sulphuretted or carbonated. Among the latter is one closely resembling the celebrated Apollinaris water of Rhenish Prussia. Another spring resembles the Sprudel Spring of Carlsbad. Many of the springs have been improved and are used, to a considerable extent, as resorts. The White Sulphur Springs, Hunter's Hot Springs, and Ferris's Hot Springs are well known locally, while the Broadwater Hot Springs, near Helena, are scarcely excelled anywhere, especially in the matter of improvements. The plunge bath there, connected with one of the hotels, is one of the largest in the world.

Among the Pacific coast States, Oregon comes next to California in the number of its mineral-spring resorts, and there are a number of springs both in Oregon and in Washington where the waters are bottled and offered for sale. The State of Washington has the celebrated "Medical Lake," in Spokane County, the waters of which are condensed, and the evaporated salts put up in packages and extensively sold. Lastly, Alaska, whose springs have never been mapped, is a hot-spring territory that has few equals. So far as is known, the springs are generally saline and sulphuretted.

The practical point in this *résumé* of our mineral springs is that, within our own borders, we have springs that duplicate those of Europe, or, indeed, of any other part of the world, and we have them at all elevations, from that of the Atlantic or Pacific coast to the high mountain areas of Colorado, the apex of our country, where the mountain peaks were above the water as islands while the rest of the country was beneath the seas.

We have springs also under all climatic conditions, from the equable climate of Southern California to the glacier-bound regions of Alaska, and from the sunny skies of Florida to the bracing air of New England.

## HIGH BUILDINGS.

THE high building problem in New York has recently been under consideration by the Chamber of Commerce, and was referred to a committee consisting of Louis Windmuller, Constant A. Andrews, and George R. Gibson. This committee submitted the following report:

"Your committee has considered the question referred to them at the last meeting, to wit: 'If, in their judgment, the construction of buildings in this city without limit as to height, and without reference to the width of the streets, is consistent with the public health and welfare,' and beg to report:

"After consultation with many of the best known experts, the committee has come to the conclusion that the interests of a majority of our citizens require that action be taken to limit the height of buildings on our thoroughfares. Your committee has first considered objections to tall buildings generally; it appears evident that the health of occupants of their lower floors and of ordinary houses in their immediate neighborhood must suffer for want of proper ventilation and sunlight. These conditions would become aggravated, and the eyesight of those tenants would suffer, by the compulsory use of artificial light if the number of tall buildings should materially increase.

"While such buildings are chiefly adapted for offices, their use is not restricted, and their safety may become impaired by weight of merchandise or vibration of machinery when owners cease to find them profitable for offices, and allow them to be used for mercantile or manufacturing purposes. The Taylor Building, on Park Place, once considered fireproof, collapsed about four years ago, burying sixty workmen in its ruins, in consequence of the weight of some machinery which had been placed in it. There are some large buildings down-town, which for years have been popular for offices, on

account of superior light and ventilation, of which, it is said, that the owners intend to adapt them for other purposes since the light has been diminished by taller buildings opposite.

"The danger of outside fires was demonstrated recently in Bleecker Street, where the building of the Manhattan Savings Bank was ignited within half an hour by the burning of a house on the other side of the street. A similar danger threatens any tall building situated opposite a combustible structure in case of fire. Experience to furnish data as to the safety of steel frame construction, such as now frequently used, is wanting; we know that greater restrictions are placed in Chicago upon the height of buildings so constructed than upon buildings of masonry. Several experts have expressed a belief that the metal is liable to corrosion by moisture arising from the foundation, by rain piercing through the walls, and by leakage of water pipes. It becomes impossible to discover such defects when the frames are covered by masonry, and the weakening of any portion may become disastrous to the whole structure.

"Fire inside of buildings so constructed may warp and dislocate portions of their frames, and in all tall buildings smoke from the burning of the contents of an office may reach the upper floors through elevator and stair shafts, endangering the lives of occupants; it appears to be difficult to render assistance to them when they are more than one hundred and fifty feet above the street level.

"Your committee offers the following preamble and resolutions:

"*Whereas*, The continued erection of tall buildings would be a menace to the health and welfare of our city; be it

"*Resolved*, That this Chamber favors the passage by the State Legislature of laws,

"1. To limit the height of buildings in this city in proportion to the width of the street.

"2. That all buildings over 80 feet shall not occupy more than 80 per cent of the ground they stand upon, a restriction similar to the one now applied to tenements.

"3. That such buildings shall be provided with at least two fireproof staircases, and that all shafts for stairs and elevators be encased in brick walls and be lighted from above.

"In Berlin the height of buildings is limited to the width of the street; in Paris to about 50 per cent over such width; in Chicago, to 130 feet, and in Boston, to two and a half times the width of the street. If no restrictions should be enforced, there is danger that high buildings will gradually supplant lower ones in parts of the city where offices are in request, until sunshine will be shut out from the streets. An intense and uncontrollable fire may crumble such buildings, as similar structures were destroyed in Boston and Chicago, consume the contents, and increase the danger to life from falling walls."

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TYPHOID-FEVER AND THE WATER-TANK.—The intimate relation of typhoid-fever to the water-tank of the railway car, says the *Insurance Monitor*, was strikingly exemplified a few weeks since by the experience of the medical director of one of our principal life companies. His family had been sojourning for the summer at a popular resort. Very shortly after returning to his home three children were simultaneously taken down with the disease. No other case had occurred among the numerous guests. The origin was investigated, and it was found that the water-tanks on the train returning had been filled from a village well on the way. The fever was raging there among those who were using the water. The trifling quantity drank during the few hours of transit was sufficient to implant the germs of the disease.

A LONG-LIVED FAMILY.—A family named Hindale is reported from Mount Holly, N. J., consisting of eight members. The oldest is ninety-one years of age and the youngest seventy-two. Their average is eighty-two years. The most remarkable feature about this family is that they are children of consumptives. The father died of that disease at forty-eight and the mother at fifty-two. No trace of the disease is discoverable in the children.

Once this would have been inexplicable, but we now know consumption as a contagion may be communicated to those having no predisposition. This is probably the true explanation, or else on the principle of atavism, the children have inherited the constitution of a more remote ancestor.—*Insurance Monitor.*

# MEDICAL EXCERPT.

By T. P. Corbally, A.M., M.D.

Treatment of Diabetes Mellitus.—Alfred B. Garrod, F.R.S., in his work on the "Essentials of Materia Medica," says that as a remedy in diabetes, with yeast or cerevisial fru-mentum, there has been no proof given of its efficiency. So many remedies in this disease have been tried with varying or with doubtful success, that some practitioners have fallen back on the old remedy, hoping to obtain some benefit from it by promoting fermentation. Some successful cases have been reported.

The following note, which the *Anales del Departamento Nacional de Higiene*, of Buenos Ayres, credits to the *Revue Internationale de Méd. Prat.*, gives the history of three cases relatively successful.

"Yeast, given in doses of from a dessert-spoonful to a table-spoonful, each at meals, to three diabetic patients, two men and one woman, yielded very satisfactory results, although its use could not be continued for a sufficient length of time, because during warm weather it was difficult to prevent active or putrefactive fermentation. When first given it caused, soon after ingestion, the formation of great quantities of gas, which was removed by frequent eructations, and after the first day by a very fœtid diarrhœa of fecal matter and the discharge of great quantities of gas. After a few days complete tolerance was established. . . .

"After fifteen days had expired an increase in weight of three, five, and eight pounds, respectively, was observed in the patients, one of whom was phthisical as well as diabetic, and had lost thirteen kilos in weight during the preceding three years; and in another of the cases the attack of diabetes was extremely severe.

"A fact that proved the directly favorable action of the remedy was the rapidity with which a decrease in weight followed a discontinuance of the remedy.

"Lastly, the urine was improved, the amount of urea remained the same, or was slightly increased, the sugar was decreased. In one case it was reduced from 32 to 7.40 grams. This was a reduction, if account be taken of the whole quantity passed by the patient, of three quarters in fifteen days, and there was a reduction of two thirds in another case."

The *modus agendi* of the yeast in such cases has not as yet been fully determined. Future experiments must account for this action.

HAY-FEVER.—M. Joal has issued a most important work, in which he arrives at the following conclusions (*La France Médicale*, January 24th, 1896): "Hay-fever is strictly a reflex neuropathic affection of the nose. The predisposition to it is established by three distinct factors: arthritism, nervosism, nasal hyperexcitability. By far the greatest number of persons affected with the disease have all the characteristics of defective nutrition, and the evident signs of neurasthenia. There is a decided incompatibility between hay-fever and the more serious nervous affections.

"Vaso-motor disturbance of the nasal mucous membrane predominates at the beginning of the paroxysmal attacks; they may appear independently of all hyperthropic changes; but usually a certain degree of hyperesthesia of the pituitary is present. The vaso-motor and spasmodic phenomena are subject to secondary reflex action of the nose. These reflex changes arise spontaneously (1) from excitement of the sensorium; (2) from excitement referable to general sensibility. Among the former of these, a preponderating influence is attributable to special odors; among the second may be placed luminous impressions. On the other hand, heat and dust have their share, either by irritating the skin or by acting mechanically on the nasal mucous membrane.

"The specific action of pollen and of certain micro-organisms cannot be admitted. That the disease shows itself in an irregular or periodic manner depends on two classes of facts, very different in action and originating in the same general conditions of constitution, united with the same generic conditions of the pituitary and the nerve centres. The following are the principal occasional causes: odors, light, and heat,

which, by occurring regularly at the same season of the year, determine the periodicity of the attacks."

The above statement presents the disease under an aspect very different from any which has been held heretofore, and is entirely at variance with the ideas that gave origin to the name. How far these views may be found correct will depend on careful observation, and may lead to an entirely different method of treating the disease. It is evident that the methods heretofore employed have been far from satisfactory.

SERUMTHERAPY.—Dr. P. Patet gives (*La France Médicale*, January 24th, 1896) a brief historical account of serumtherapy from a clinical view-point of its application in Lyons.

From his observations in the diphtheritic wards of La Charité, Lyons, he draws the following conclusions, which are similar in every respect to what has been observed in Paris:

1. Serumtherapy has thus far given very satisfactory results. It has notably lessened the mortality from diphtheria.

2. The accidents reported as happening during the treatment of diphtheria with the serum should be all attributed to the disease itself.

3. A single exception is that the eruption seems to have been more frequent since the use of the serum.

4. Not one of these cases of eruption has been in any degree dangerous, nor even severe.

5. The serum acts only on the bacillus of Löffler; it has no action on microbes associated with the bacillus.

6. The action of the serum is always more prompt and more certain when the treatment is commenced at the beginning of the disease. The injection, as a prophylaxis, has been made in doses of from one to two cubic centimetres, and has always been borne without any inconvenience, except the transient eruption.

PSEUDO-DIPHTHERITIC BACILLUS.—In a case of dacryocystitis, M. Faye, of Amiens, has reported to the Société de Médecine Légale (*Le Progrès Médicale*, January 18th, 1896) the following:

"As has already been pointed out in different cases of con-

junctival affections, the presence of the pseudo-diphtheritic bacillus scarcely differs from that of Löffler, except in the absence of virulence. I have observed, in a case of chronic dacryocystitis, that the patient had recently an acute attack; the preparations in different cultures have shown it with its classical peculiarities. Other non-pathogenic microbes were found in connection with it. The inoculation of the mucous membrane of the pharynx of a pigeon produced a little false membrane. The subcutaneous inoculation of a guinea-pig, which it does not kill, proves the freedom of the bacillus from virulence. It is known that many bacteriologists, and especially MM. Roux and Yersin, have identified the pseudo-diphtheritic bacillus with the virulent, believing that the former is the modified form of the latter. In these conditions is it not legitimate to ask if the pseudo-diphtheritic bacillus does not act a certain part in cases of conjunctivitis, either by assuming virulence or by uniting with other microbes? It has always happened that, with our patient, it seemed, so to say, that it obtained the mastery over the microbes that were associated with it, and which, besides, were of a non-pathogenic species."

*M. Morax:* "It is time to cease the abuse that has been made of the diphtheritic bacillus, by attributing to it characteristics that have not been demonstrated. Many of the kinds of microbes may be obtained by different procedures, and present the same form and resemble the diphtheritic bacillus. The only way by which they can be differentiated is by inoculation. But in the case of M. Faye it was a question of non-virulent bacillus. In order to consider it as a pseudo-diphtheritic bacillus, it must have other characteristics. It is not known that a non-virulent bacillus may become virulent. An examination of the secretions of the mucous surfaces reveals the existence of the pseudo-diphtheritic bacillus; but when we plant in a single medium, it is difficult to pronounce on the character of the microbe. The bacillus of Weeks has also been confounded with the ordinary bacillus, but the characteristics which it presents do not authorize us to place it in the category of all the other bacilli.

"From the fact that M. Faye has found the bacillus of which he speaks, we cannot conclude that it possesses a real pathogenic character."

*M. Faye:* "I have not affirmed anything regarding the *rôle* that this bacillus may play. I have simply asked a question. In regard to its nature, it seems difficult not to class it among the pseudo-diphtheritic bacilli, and in that respect I am in accord with the ideas of M. Roux, who affirms that it is an attenuated form. Besides, I have made cultures in all mediums, and have obtained the characteristics common to the diphtheritic bacillus; but I have not been so far able to draw positive conclusions."

"FELLOWS COMPOUND SYRUP OF HYPOPHOSPHITES (London *Lancet*) is an admirable tonic for the nervous system and digestive organs; a valuable auxiliary in the treatment of bronchial and pulmonary diseases; highly recommended by physicians in all parts of the world."

MILK BATHS AS A REMEDY.—Since it has become known that milk in a bucket sitting in a sick-room will absorb germs, a recent writer (*Medical Press and Circular*) has applied the idea in the treatment of small-pox, fevers, diphtheria, etc., with marked success. The patient is laid on a mattress covered with blankets. He is then packed in a sheet saturated with milk, covering the entire body, in which condition he remains an hour. A warm water bath is then given, after which the surface is dried and the patient is put to bed.

PURE WATER.—Water flowing through a granite region is likely to be the purest, says *Safety Valve*. If water contains gypsum (plaster of Paris—sulphate of lime) boiling will not suffice to soften it—soda must be added while boiling. There is, too, a more expeditious and cheaper way of softening hard feed water than boiling it; that is, by adding lime water to take away that excess of carbonic acid which holds in solution the carbonate of lime present in the water. Where well water is being used which contains organic matter, filtering through charcoal, introducing chips of oak, will coagulate the organic matter. Alum will also suffice.

PROTONUCLEIN IN TONSILITIS.—Recently, in the case of a child four months old and otherwise healthy, I used protonuclein to relieve acute tonsilitis, in which the glands were very much swollen and accompanied with pharyngitis and

enlargement of the parotid gland. I gave the protonuclein with other remedies quite freely, and found it effective in controlling the local irritation. Because the remedy was not faithfully administered I abandoned the case after a week, but the child was nearly well. A week later I was asked to see the case again, but found it in charge of another doctor, and all the symptoms of the disease more severe than when I saw it the first time, a circumstance which confirmed the value of the first treatment.—T. P. C.

SUBSTITUTORS.

BATTLE & CO., CHEMISTS' CORPORATION,
ST. LOUIS, MO., February 3, 1896.

*Editor* SANITARIAN :

In your January number you ask your readers to send you the names of druggists found substituting, together with evidence of same, and say that you will publish the names and addresses of the substitutors. We send you below the names and addresses of a few that we have caught substituting. The samples were purchased on prescriptions, and are now in the hands of the purchasers—have never left their possession—two gentlemen of good standing, and who are willing to appear at any time and place to give their testimony if necessary. We will guarantee to prove the substitution. The names are as follows :

Stegner Drug Company, corner Grand and Easton Avenues, St. Louis ; J. W. Crain, 75 West Madison Avenue, Chicago ; International Pharmacy, 422 South Clark Street, Chicago ; Merz Brothers, southwest corner Twelfth Street and Ogden Avenue, Chicago ; Richard Jentzsch, Twelfth Street and Ogden Avenue, Chicago ; Stolz & Crady, 104 North Clark Avenue, Chicago ; Charles H. Schad, 344 East Washington Street, Indianapolis ; Charles S. Mayer, Fifth Avenue and York Street, Louisville ; E. Kampfmueller, Seventh and Broadway, Louisville.

Respectfully yours,
C. A. BATTLE, *Vice-President.*

IF you wish to keep the mind clear and the body healthy, abstain from all fermented liquors, and don't eat too much.

# EDITOR'S TABLE.

## SANITARIAN, MARCH NUMBER, 1896.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

TENEMENT-HOUSE REFORM.—"Here's a good scheme." Got almost to it at last:

The Tenement-House Commission has presented to the Legislature a bill giving the city of New York power to condemn all rear tenements and convert their sites, together with the unoccupied area in front and rear, into courts, bounded on all sides by the rear walls only of the existing front buildings.

The city is to be authorized to expend $5,000,000 a year in land damages and expenses until the improvement is completed, and the title to the property condemned is to be taken by the city.

In making this application to the Legislature, the Commission makes this recommendation:

"Simultaneously with the destruction of the rear buildings, a system for the construction of small individual homes, not tenements, on the outskirts of the city, should be undertaken by private capitalists in sympathy with 'tenement reform,' who would not only do great good, but get a satisfactory return on their investment. The improvement in transit would enable these homes to be well and cheaply constructed in blocks on land now comparatively cheap, and yet near enough to be taken into the corporate limits of New York, thus retaining population and enlarging the taxable area to the great benefit of the municipal treasury. Railroad companies leading to the new homes would probably help. If philanthropists, economists, social reformers, church organizations, trades-unions, real-estate dealers, builders, and others interested will agitate along these lines, they will quickly reduce the congestion in the tenement districts and practically transform Manhattan Island. They will improve moral and social conditions, will not only create good homes for the wage-earners, but will furnish remunerative labor to every grade of artisan employed on a building. The improvement will stimulate real-estate values in New York, and will also benefit the merchant

and the manufacturer, as it will create a demand for all building supplies."

*Thirteen years ago*, THE SANITARIAN took occasion to say with regard to the tenement-houses at that time, without limit to the rear buildings, and here repeats:

"Public economy and public health alike demand that many of such houses and lots should have their valuation assessed, possessed by right of public domain, and the buildings removed; and the ground turfed over for air space. A law requiring the Board of Health to designate, say, twelve of the worst tenement-houses in the city annually for ten years to come, for assessment and possession by right of public domain, would not only be a potent means of tenement-house improvement, but would save the city in the costs of pauperism, vice, and crime, now due to the tolerance of such structures, many times the amount of the assessment. And in view of the present accessibility of cheap building lots in the vicinity by means of the now accomplished rapid transit by railways and ferries in almost all directions, it is unreasonable to suppose that persons accustomed to investments in tenement-houses, who might by this means be deprived of their privileges in these overcrowded districts, would not still follow their bent under restricted conditions" (Vol. VII., p. 181).

THE ANTI-VACCINATIONISTS' DEFEAT.—At the time our February number went to press, the suit of Peter Burggraf, instigated by the anti-vaccinationists to recover $5000 from Health Commissioner Z. Taylor Emery and Vaccinator Dr. Frank E. Boyden, of Brooklyn's Health Department, for the death of the plaintiff's child from lockjaw, alleged to have been produced by enforced vaccination, was pending.

The contention was, by plaintiff, that Dr. Emery had no right to vaccinate the girl without the parents' consent; that it was an assault on her, and he is therefore responsible for the consequences. The child was vaccinated April 10th, and became sick immediately after the vaccination. She went to school for a few days, but had lockjaw and died on May 2d. A coroner's jury declared that the lockjaw was due to the vaccination. Health Commissioner Emery and Dr. Boyden

claimed that the pupils in the school were vaccinated in pursuance of their duty. They were told that if any objected to being vaccinated by the department, they could go to their family physician. But if they desired to remain in school they must be vaccinated by some one. Julia Burggraf, they say, made no objection to the vaccination.

Much conflicting testimony was adduced. As against Dr. Emery—in the exercise of his functions as Health Commissioner—the plaintiff was non-suited, on the ground that no evidence had been brought forward to show that he had authorized the vaccination of Julia Burggraf by Dr. Boyden. The case was sent to the jury on the single question as to whether or not Dr. Boyden was negligent in his manner of vaccinating the girl. The jury discussed the matter for ten hours, disagreed, and were discharged. The plaintiff's counsel expressed his desire to appeal to the Appellate Court from Justice Van Wyck's decision that Dr. Emery cannot be held liable under the evidence adduced, and if he is successful in securing a reversal of that decision, the whole matter can be sent back and tried over again.

THE MILK SUPPLY OF NEW YORK CITY.—At a meeting of the Academy of Medicine, January 10th, the milk supply of the city and the measures exercised for its protection were special subjects of discussion. Health Commissioner Fowler said:

"The average daily milk receipts of New York City, including milk, cream, and condensed milk," he said, "are 766,560 quarts, of which 78 per cent is from New York State, and represents the yield of 100,000 cows.

"This is serious when taken in connection with legislative considerations. If we can control New York State, we control 78 per cent of the milk that comes here.

"We have only $20,000 and five inspectors to look after the 100,000 cows of New York State, and see that they are not affected with tuberculosis, and to compensate owners for cattle and horses (with glanders) killed. We should have $400,000."

The railroads, Dr. Fowler said, were encouraging the bringing of milk from the most distant counties in the State by charging the same rates a can as for the shorter distances. Milk from Hornellsville and milk from Orange County thus cost the same—35 cents a can.

Methods for the prevention of the sale of adulterated milk were described by Dr. Edward W. Martin, Chemist of the Board of Health.

"So far as adulteration is concerned," he said, "99 per cent we find to be water or skimming. Only a small percentage is included in the adding of antiseptics, such as borax, etc."

Dr. Martin explained in detail the method of the milk inspectors, how they carry their books, lactometers, thermometers, and sealing irons. He told of one dealer who sells 800 quarts a day, and was fined in the Court of Special Sessions for adulteration as follows: November 21st, 1887, $100; March 27th, 1889, $200; October 16th, 1889, $100; September 26th, 1890, $100; October 10th, 1892, $250; May 31st, 1893, $250.

"And this man is still in the business," added Dr. Martin, with a sigh.

Dr. Lederle spoke of the methods of detecting adulteration in milk. First of all, he said, before the milk is tested it must not be acid, nor must not have been churned. The legal milk standard for fat and total solids in New York State is, respectively, 3 per cent and 12 per cent; in New Jersey, 3 and 12; in Massachusetts, 3 and 13.

Dr. Lederle described a few useful and simple tests. The lactometer, he said, has been severely criticised, but it is a good instrument. It is simply a hydrometer for testing the specific gravity of liquids. The lactometer must be used with judgment. The lactoscope is another instrument used by the competent milk inspector. It tests the quantity of butter fat in the sample. In conclusion, Dr. Lederle gave some statistics. Work of milk inspectors during 1895 is as follows: Number of inspections, 72,036; specimens examined, 99,086; citizens' complaints investigated, 166; quarts adulterated destroyed, 2677; arrests, 408; held on bail, 398; trials, 364; fines, $12,260; days in jail, 87.

"REMEMBER that your wife, your children, and your servants have *rights* and *feelings*; treat them as you would treat persons who could turn again," was one of Sydney Smith's best sermons.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

*Health of the Army.*—George M. Sternberg, Surgeon-General, U. S. A., reports for the fiscal year ending June 30th, 1895 :

The mean strength of the Army during the year, according to its medical reports, was : Whites, 22,904 ; negroes, 2086 ; Indians, 386 ; total, 25,376. The admission rate of the negro troops was considerably less than that of the white soldiers, 811.60 as compared with 1116.44 ; and this lower rate was due to a relative freedom from disease, for their admission rate for injury was as high as that of the white troops. Their number constantly sick was 25.93 per 1000, while the corresponding rate among the whites was 35.18 ; and the average number of days lost by each on account of sickness or injury was, respectively, 9.5 and 12.8. The rate for discharges also was lower among the negroes, 9.40 as compared with 13.56 among the white troops. There was little difference in the death-rate of the two races. This is the most favorable showing yet made by the statistics of sickness among the colored troops of our Army.

The health record for the calendar year 1894 is a most satisfactory one. Taken as a whole, it may be said to be the best annual record ever consolidated from returns sent in by United States Army medical officers ; for although the death-rate is a fraction higher than the lowest rate ever recorded, the other rates are by far lower than they have ever before been in the history of our Army.

Infectious diseases, general and local, gave an admission rate of 273.51, or one fourth of the total admissions, while causing one third of the non-efficiency, showing in this that although the rates have been much reduced this year there is considerable room for improvement by the suppression of infection. To the high rate of these infections venereal diseases contributed 80.43 per 1000 of strength, while malarial diseases gave only 74.72, a notable fall from 114.50, the average of the previous ten years. Injuries took second place as causes of admission, with a rate of 244.21 ; diseases of the digestive system third, with 237.23, and of the respiratory system fourth, with 79.76.

The death-rate from all causes was 6.69 per 1000 of strength,

as against 6.91 and 8.22 for the previous year and decade. The death-rate from injury was 2.13, so that the rate from disease was 4.55, as compared with 4.01 of the previous year, 3.95 of the year 1889, the lowest recorded rate for disease, and 5.64, the average rate of the years of the previous decade.

The following tabulation shows these favorable comparisons at a glance :

| Army. | Mean Strength. | Ratios Per Thousand of Mean Strength. | | | | | | Sick Time for Each Soldier. |
|---|---|---|---|---|---|---|---|---|
| | | Admissions. | Deaths. | | | Discharges. | Constantly Non-Effective. | |
| | | | Disease. | Injury. | Total. | | | |
| | | | | | | | | Days. |
| United States, 1894..... | 25,376 | 1,089.73 | 4 55 | 2.13 | 6.69 | 13.30 | 34.49 | 12.6 |
| United States, 1893..... | 25,287 | 1,289.04 | 4.01 | 2.89 | 6.91 | 14.93 | 40.15 | 14.7 |
| United States, 1883-92... | 24,046 | 1,376.89 | 5.64 | 2.58 | 8.22 | 26.48 | 42.51 | 15.5 |

The deaths numbered 185, as compared with 191 in the previous year. Fifty-nine were due to accidents ; 49 to infectious diseases, general and local, 20 of which were due to typhoid-fever and 17 to consumption ; diseases of the nervous system, 24 ; of the respiratory organs, 19 ; of the circulatory system, 15. Eight deaths were caused by alcohol and its *direct* results.

The death-rates varied from 4.80 in the Department of Colorado to 13.99 in Texas. In the Departments of Dakota and California the death-rates were lower than the average of the Army, 6.69 ; in the other departments they were higher. The rate of discharge for disability was lowest, 6.76, in the Department of the Platte, and highest, 24.22, in the Department of Texas. In the others it did not vary much from the average.

The Department of the Columbia had the best record for the year ; the Department of Texas, the worst.

During the past year the preponderance of disease among the whites as compared with the negroes was due mainly to malarial diseases, venereal infection, alcoholism, tonsilitis, diarrhœal diseases, and affections of the eye. During former years, as, for instance, during the past decade, the preponderance among the negroes was due to venereal diseases, neural-

gia, tonsilitis, colic, constipation, rheumatism, and eye diseases. During these years alcoholism was about the only disease the prevalence of which was greater among the whites than among the negroes. During the past year alcoholism continued to be more prevalent among the whites than among the negroes, while rheumatism was about the only disease that affected the latter more than the former.

The number of Indians was so small that it is unnecessary to dwell on their statistics. Their death-rate was exceedingly high, 20.27 per 1000, due, as in previous years, to consumption, pneumonia, and injuries.

*Alcoholism* in the Army continues to decline. The admission rate for the past year was 30.94 per 1000 of strength as compared with 33.97, 37.23, 40.01, 40.73, and 41.41 in the five preceding years, and with 56.68 in the decade ending with 1889.

Captain E. L. Swift treated three cases of chronic alcoholism with hypodermic injections of .002 gram nitrate of strychnia three times a day, but in none was any satisfactory result obtained. There was a temporary improvement in each instance, but the men relapsed into their old habits within ten days after the cessation of medical observation and treatment.

*Rational Treatment of Drunkenness.*—Captain W. H. Arthur reduced the statistics of alcoholism at Vancouver Barracks by dealing with drunkenness as with acute poisoning. He reported as follows:

"The report of the Surgeon-General for the year ended June 30th, 1892, mentions this post as having out of all the Army the highest rate of admission to sick report for alcoholism. The number of cases of simple acute alcoholism that appeared at sick call and during the day, when I first assumed charge of this hospital, was unusually large, and resulted in the laying down of certain rules in an effort to discourage drunkenness as far as it was in my power. No man is taken on the sick report or excused from any duty unless, in my opinion, his condition would make it actually dangerous for him to keep at work. I may say here that such cases are in my experience very rare, and that a mistaken pity for a man suffering from the effects of a debauch is liable very often to lead a too indulgent post-surgeon to excuse him from duty when the guardhouse, and not the hospital, is the proper place for him. I am confident that this mistaken kindness

has done a great deal in the past to encourage drunkenness. Each man who has reported at the hospital in any stage of simple alcoholism is treated as a case of alcoholic poisoning, taken immediately to the operating room, his stomach emptied by the use of the stomach pump, and thoroughly washed out with warm 2 per cent soda solution. After this he is given a bowl of hot beef extract, with cayenne pepper, allowed an hour's rest, after which he is generally perfectly able, however unwilling, to do his duty. If the weather is severe, either very hot or very cold, it might not be safe in his depressed condition to force a man to work out-of-doors immediately after this procedure, but at this post the extremes are not great, and it has in no case resulted prejudicially to the patient. Occasionally some resistance is met with, but two, or at most three, able-bodied hospital corps men and a perforated wooden gag, such as comes with the stomach pump, will, with patience and determination, overcome almost any ordinary opposition. I have found for this purpose the gum elastic stomach tube in the old-fashioned stomach-pump case, connected with Allen's surgical pump, work very satisfactorily. The ordinary soft rubber lavage tube is too easily collapsed, and is more difficult to introduce when there is resist ance.

"The effect of this treatment has been uniformly excellent. The stomach, emptied of its irritating contents and cleansed of the thick, tenacious mucus that is always present in such cases, is much less irritable and rarely rejects the beef extract which is given immediately; the nervous symptoms improve at once, and sedatives administered by the mouth have a far more prompt and lasting effect, and in almost all cases the craving for liquor is very much diminished. Of course cases may occur which are too serious for such summary treatment. I have not met with any myself, and have used the stomach pump with good effect in cases even of delirium tremens and alcoholic coma. These cases, of course, are promptly taken into the hospital, and treated as dangerously sick men. The deterrent effect of this treatment is excellent. It is, of course, not agreeable, though no one can deny that it is perfectly rational and merciful. In the past ten months but one man has been admitted to hospital for alcoholism. There are, no doubt, other factors that enter into the production of this marked change in the post in two years, but I am confident that this method of treating alcoholism as poisoning has been a very important, if not the principal one. I may add that in but one case has it been necessary to use this treatment on the same man more than once."

(THE SANITARIAN earnestly commends this treatment to

civil life, particularly to police courts, to be carried out by the police surgeons instead of commitments at public expense to sleep off the drunk.)

*Classification of Diseases.*—Among the particularly notable changes, differing from previous reports, is a new system of classification of diseases. It is remarked that until recently the classification of diseases and injuries pursued was based on that of the College of Physicians of England, now deemed by the Surgeon-General to be inconsistent in many respects with our present knowledge of the causation and processes of disease. He has therefore constructed a new system, in which the causes of disability are aggregated into five principal classes: (1) infectious diseases, general and local; (2) diseases of nutrition, general; (3) structural and functional diseases of organs; (4) accidents and injuries; (5) unclassified. Many of the diseases now classed as diseases of particular organs are placed among the infectious diseases, such as tonsilitis, pericarditis, endocarditis. Of the diarrhœal diseases of the old list, acute dysentery has been placed among the infectious.

*The Sanitary Condition of the Army* is summed up in abstracts from the reports of the medical officers, and on the whole shown to be excellent. It is only when recommendation is made to remedy some unsanitary condition that note is made of the fact. But throughout the reports from the different medical officers, as the Surgeon-General's innovations and summary, preventive medicine is the Army surgeon's chief reliance for a healthy and efficient soldiery.

ALABAMA.—*Mobile*, 31,076: J. A. Abrahams, M.D., Health Officer, reports for December: Deaths, 66—21 under five years of age. Annual death-rate, 25.

*Selma*, 7622: J. A. McKinnon, M.D., Registrar, reports for January: Deaths, 16—6 under five years of age. Death-rate, 23.2.

ARIZONA.—Phœnix (*Gazette*), January 11: *Globe* is now in quarantine for *diphtheria*, no one being allowed to go in or come away until the scourge is over.

ARKANSAS.—Little Rock, February 11: *Small-pox* is still prevalent in Monroe and Prairie counties. Dr. H. C. Duna-

vant, President of the State Board of Health, reports 24 cases near Holly Springs, Monroe County, and 8 cases near Surrounded Hill, Prairie County.

CALIFORNIA.—J. H. Davison, M.D., President, Los Angeles; J. R. Laine, M.D., Secretary, Sacramento.

The Secretary reports for January from 52 cities, towns, and sanitary districts, aggregating a population of 716,806: Deaths, 953; annual death-rate, 15.84. Deaths from *consumption*, 99; acute lung diseases, 52; *diphtheria* (and croup), 13; *typhoid-fever*, 19. Three cases of *small-pox* in the southern part of the State, introduced from Arizona.

*San Francisco*, 330,000: Deaths, 493—88 under five years of age. From *typhoid-fever*, 10; *consumption*, 97. Annual death-rate, 16.6.

*Los Angeles*, 100,000: Deaths, 126—26 under five years of age; *consumption*, 23; acute lung diseases, 24; *diphtheria* (and croup), 4; *typhoid-fever*, 4. Annual death-rate, 15.12.

COLORADO.—*Denver*, 145,000: William P. Munn, M.D., Health Commissioner, reports for December: Deaths, 136; from *phthisis*, 30—24 contracted elsewhere. Annual death-rate, 11.25.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. A. Lindsley, M.D., Secretary, New Haven.

*Monthly Bulletin* reports for January from 167 towns, 1121 deaths—5 more than in December, and 109 less than the average in January for the five years preceding. Death-rate, 16.3 for the large towns; small towns, 16.8, and 16.4 for the whole State. Deaths from *consumption*, 109; *diphtheria* (and croup), 35; *typhoid-fever*, 14. Diphtheria continues prevalent in Bridgeport, 28 cases; Hartford, 21; New Haven, 20; Waterbury, 11.

DELAWARE.—E. W. Cooper, M.D., President, Camden; E. B. Frazer, Secretary, Wilmington.

*Diphtheria* is epidemic in Milton.

DISTRICT OF COLUMBIA, white, 187,600; colored, 87,900: 275,500. W. C. Woodward, M.D., Health Officer, reports

for four weeks ending February 8th : Deaths, 430—189 colored people. Death-rate, white, 16.7 ; colored, 27.9. Deaths from *typhoid-fever*, 8 ; *diphtheria*, 12 ; *consumption*, 45.

FLORIDA.—Hon. W. B. Henderson, President, Tampa ; Joseph Y. Porter, M.D., State Health Officer, Jacksonville.

February *Bulletin* summarizes 45 county and 5 city reports for December, with an aggregate population of 391,422 : Births, 442 ; marriages, 675 ; deaths, 282—61 under five years of age. Birth-rate per 1000 per annum, 13.02 ; death-rate per 1000 per annum, 8.43. Chief causes of death and number from *consumption*, 40 ; heart disease, 38 ; pneumonia, 21 ; paralysis, 21 ; old age, 12.

*Pensacola*, 15,000 : Reports for January : Deaths, 15 ; from consumption, 5. Annual death-rate, 12.

ILLINOIS.—William E. Quine, M.D., President, Chicago ; J. W. Scott, Secretary, Springfield.

*Chicago*, 1,600,000 : William R. Kerr, Commissioner, reports for January : Deaths, 2013—880 under five years of age. Annual death-rate, 15.08. Deaths from *diphtheria*, 118 ; *typhoid-fever*, 87 ; *consumption*, 196 ; pneumonia, 232.

Death-rate of diphtheria (*Times-Herald*, January 20th) : Under antitoxin treatment, 8.93 per cent. ; without antitoxin, 52.46 per cent.

*Collinsville* (February 9th) : *Diphtheria* epidemic.

INDIANA.—Indianapolis, 155,000 (*Sentinel*,) January 29th. Report for the year 1895 : Deaths, 2033—453 under five years of age ; death-rate per 1000, 13.76 for the white and 20.85 for the colored (14,000). Of the deaths 291 were due to *consumption*, 114 to *diphtheria* (of which there were 494 cases) ; 122 to *typhoid-fever*.

IOWA.—Frederick Becker, M.D., President, Claremont ; J. F. Kennedy, M.D., Secretary, Des Moines.

*Davenport*, 31,484 : A. W. Cantwell, M.D., Physician to Board of Health, reports for January : Deaths, 43—6 under five years of age ; from consumption, 2 ; bronchitis, 4 ; diphtheria, 1 ; *old age*, 9.

LOUISIANA.—S. R. Oliphant, President, New Orleans; W. R. Harnan, M.D., Secretary, New Orleans.

*New Orleans*, 300,000 (80,000 colored): S. R. Oliphant, M.D., President.

Report for January: Deaths, white, 447; colored, 341. Death-rate per 1000 per annum for the month: Whites, 27.45; colored, 34.38.

At a meeting of the State Board, February 12th, Dr. Finney, Chief Sanitary Inspector, reported the continued prevalence of *small-pox*, notwithstanding the strenuous efforts made to suppress it. This is due mostly to the importation of new cases and the occurrence of cases in that portion of the city which was not covered by vaccination, owing to the lack of funds to complete the work. Three weeks ago there were but 9 cases in the city. Since that time there have been as many as 34 at one time. There are at present 29 cases, all of which are in the Small-pox Hospital—but 1, under quarantine.

MAINE.—C. D. Smith, M.D., President, Portland; A. G. Young, M.D., Secretary, Augusta.

A circular letter has been sent to the physicians which is expressive of the judgment of the State Board of Health on the present status of the question of the value of diphtheria antitoxin, which indicates the dosage and method of use, and which gives the names of a number of druggists at different points in the State who keep diphtheria antitoxin and syringes for its administration.

MARYLAND.—John Morris, M.D., President, Baltimore; James A. Steuart, M.D., Secretary, Baltimore.

*Baltimore*, 496,315—73,747 colored. James F. McShane, M.D., Health Commissioner, reports (*Herald*, January 18th) for the year 1895: Total mortality, 10,301—7884 white, 2417 colored. An increase of 815 over the preceding year. Death-rate for the year is 20.76 per 1000—whites, 18.63; colored, 32.06. Ratio of deaths of children under five years of age to the total mortality was 39.03 per cent. *Diphtheria* (and croup), 629 cases, 310 deaths; *typhoid-fever* (compulsory reporting went into effect July 1st), 260 cases, 173 deaths; *measles*, 2332 cases, 68 deaths; *scarlet-fever*, 775 cases, 59

deaths; *whooping-cough*, 171 cases, 68 deaths; *consumption*, 1141 deaths.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M.D., Secretary, Boston.

*Boston*, 501,083: S. H. Durgin, M.D., Chairman. Deaths for December: 929—77 under five years of age. Annual death-rate, 22.24 per 1000. From *diphtheria* (and croup), 88; *typhoid-fever*, 18; *consumption*, 112. Cases of contagious diseases reported for the month: Diphtheria, 561; measles, 42; scarlatina, 113; typhoid-fever, 62.

Summary of deaths with principal causes for 1895 compared with those of 1894: 501,083—24 *less;* total number of deaths, 11,329—191 *less;* annual death-rate, 22.60—0.38 *less;* total number from zymotic diseases, 1968—389 *less;* percentage of deaths from zymotic diseases to total mortality, 3.09 *less;* diphtheria (and croup), 654—224 *less;* cholera infantum, 500—69 *less;* phthisis, 1349—76 *less;* typhoid-fever, 163—22 *more;* small-pox, 0; 24 in 1894.

*Worcester*, 102,000: Report for the year 1895: *Diphtheria*, cases 254, deaths, 70; *scarlet-fever*, cases 132, deaths, 5; *typhoid-fever*, cases 139, deaths, 25. Death-rate, 17.91.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M.D., Secretary, Lansing.

The Secretary reports for January: Compared with the average for corresponding months in the ten years 1886–95, *typhoid-fever* and scarlet-fever were more prevalent, and intermittent-fever, consumption, pneumonia, and erysipelas were less than usually prevalent in January, 1896. Including reports by regular observers and others, consumption was reported present in Michigan in the month of January, 1896, at two hundred and forty-four places; typhoid-fever at ninety places; diphtheria at seventy-nine places; scarlet-fever at seventy-four places; whooping-cough at forty-six places; measles at thirty-two places, and small-pox at one place.

Reports from all sources show consumption reported at fifty-seven places more; typhoid-fever at seven places less; diphtheria at twenty-five places more; scarlet-fever at thirteen places more; whooping-cough at twenty-eight places more;

measles at fifteen places more, and small-pox at two places less in the month of January, 1896, than in the preceding month.

MINNESOTA.—Franklin Staples, M.D., President, Winona; C. N. Hewitt, M.D., Secretary, Red Wing.

At the annual meeting of the State Board, in Minneapolis, January 13th, the Secretary reported that there are in Minnesota 1698 boards of health, organized and co-operating with the State Board, distributed as follows: Cities, 36; villages and boroughs, 295; and townships, 1367, leaving only 27 localities, mostly small village organizations, without active boards of health.

There have been, during the year, 157 outbreaks of *diphtheria* in 51 counties, numbering 472 cases and 72 deaths; 72 of *scarlatina* in 37 counties, with 343 cases and 8 deaths, and 5 of suspected rabies in 5 counties, numbering 11 cases and 1 death, the death occurring in St. Paul.

With regard to *typhoid-fever*, *Duluth* is included with other cities of more than 5000 inhabitants. He sums up the mortality from it for 1895 as follows: St. Paul, 38; Minneapolis, 80; Duluth, 71; Winona, 1; Stillwater, 5; Mankato, 5; St. Cloud, 2; Faribault, 1; Red Wing, 3; Brainerd, 6; Rochester, 0.

*St. Paul*, 140,292: Alexander J. Stone, M.D., Commissioner, reports for January: Deaths, 109—40 under five years of age. Annual death-rate per 1000 was 9.32. Deaths from *diphtheria*, 7; *typhoid-fever*, 7; *consumption*, 11.

*Minneapolis*, 225,602: H. N. Avery, M.D., Health Commissioner, reports for January: Deaths, 179—70 under five years of age. Deaths from *diphtheria* (and croup), 16; *typhoid-fever*, 6; *measles*, 9; *consumption*, 18. Death-rate, 9.00.

*Duluth* (Minneapolis *Journal*, January 15th) is a city of 60,000 people. There are supposed to be at this time about 1400 cases of what is called typhoid, many of them being without doubt nothing of the kind. In December there were 29 deaths from the disease. Five years ago the city passed through such a siege, and at that time it was found that the sewage was being diluted and drunk, being emptied close to the intake pipe, which was broken. A due regard to the situa-

tion would have seen that the orders of the city were enforced, and that the sewer was so fixed that its liquid death could never again get back into the drinking supply of the city.

The physicians of the city held a mass meeting February 6th (Duluth *Tribune*, February 7th), and by an almost unanimous vote demanded the removal of Dr. Routh as Health Officer, and the appointment of Dr. Robinson in his place.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Willis P. King, M.D., Secretary, St. Louis.

*St. Louis*, 570,000: M. C. Starkloff, M.D., Commissioner of Health, reports for January: Deaths, 268—94 under five years of age; from *diphtheria* (and croup), 67; *typhoid-fever*, 4; *phthisis*, 86. Annual death-rate per 1000, 16.71.

NEBRASKA.—J. V. Beghtol, M.D., President, Friend; F. D. Haldeman, M.D., Secretary, Ord.

*Omaha*, 140,452: Official report for December: Deaths, 89; *diphtheria*, 26 cases, 8 deaths; *typhoid-fever*, 4 cases, 2 deaths. Death-rate, 7.6.

NEW JERSEY.—C. F. Brackett, M.D., President, Princeton; Henry Mitchell, M.D., Secretary, Asbury Park.

*Hudson County—Jersey City* and vicinity, 318,746: Report for December: Deaths, 537—211 under five years of age; from *diphtheria*, 21; from *typhoid-fever*, 9; from *consumption*, 57. Annual death-rate per 1000, 24.

*Newark*, 215,725: Health Officer Lehlbach reports for the *week* ending February 15th: Deaths, 94; from *diphtheria*, 7.

*Paterson*, 63,287: J. L. Leal, M.D., Health Officer, reports for January: Deaths, 135—50 under five years of age; from *diphtheria* (and croup), cases reported, 38, 11 deaths; *whooping-cough*, 7; *typhoid-fever*, cases reported, 9, 2 deaths; *consumption*, 18.

*Hoboken.*—Health Warden Artlitz (Jersey City *Journal*, February 13th) reports for the month of January: Deaths from all causes, 99. Contagious diseases: *Diphtheria* (and croup), 37; *scarlet-fever*, 26; *typhoid-fever*, 4. Death-rate, 21.83.

NEW YORK.—Daniel Lewis, M.D., President, Syracuse; B. T. Smelzer, M.D., Secretary, Albany.

The Secretary's *Bulletin* for December gives 9438 deaths—1000 more than for the month preceding; 500 more than that for the same month in 1894, and in excess of the average for the past ten years to the same amount. Measles is still mostly limited to the eastern part of the State, all but 14 of the 172 deaths occurring in the maritime and Hudson Valley districts. Whooping-cough has a little larger mortality, mainly in the maritime district, where there were 57 deaths of the 72 in the entire State. Typhoid-fever caused 169, which is excessive for December; the Hudson Valley district reports more deaths than in November. From diphtheria there were fewer deaths than have ever been reported in December, save in 1890, the 560 deaths being 100 less than the average of the past ten years. The increase in mortality over both that of the month preceding and of December, 1894, is in acute respiratory diseases and in diseases of the circulatory system. The mortality from consumption was not above the average for the month—1054 deaths. During the year 1895 there were 121,735 deaths—3500 more than in 1894, but less than any previous year since 1890. Delayed returns, not recorded in the *Bulletin*, to the number of 4500 deaths, make the actual reported mortality for the year 126,235. The estimated reporting population is 6,650,000, which makes a death-rate for the year of 19.00 per 1000 population; in 1894 it was 18.75; in 1893, 19.50; in 1892, 20.78; in 1891, 21.43; and in 1890, 19.65.

The zymotic mortality constituted 16.55 per cent of the total during the year; in 1894 it was 18.56 per cent. Typhoid-fever caused 1720 deaths—about 25 per 100,000 population. Diphtheria caused 5000 deaths, fewer than for several years. Its decrease occurred in all parts of the State, but chiefly in the maritime district, where there were 1200 fewer deaths from it than in 1894. Scarlet-fever caused 850 deaths, which is less than half the average yearly mortality from it for the past eight years. From measles and whooping-cough the mortality was excessive, and especially in the eastern part of the State. Diarrhœal diseases caused 9000 deaths, which is, with little variation, the yearly average in this State. There were 546 deaths reported from cerebro-spinal meningitis, and 406 from malarial diseases, the latter showing a yearly decrease

in reported mortality for eight years. From *grippe* there were 5100 deaths in the four first months of the year. Consumption caused the usual yearly mortality, a little over 13,000 deaths, and a little more than 10 per cent of the total deaths.

*Bovine Tuberculosis.*—The State Board reports that:

A somewhat careful calculation shows that to destroy all the cattle affected with this disease in the State to-day would involve an expenditure of nearly $1,000,000. Should the eradication of the disease from all herds be once accomplished, such rules and regulations as the Board is competent to enforce would prevent any importation of infected animals from other States, and thus permanently protect the people from this great menace to the public health.

The tremendous importance of this work may be fully realized when it is stated that of the deaths occurring in the State during the year over 10 per cent of the entire number from all causes were from pulmonary consumption. Hence, it is the unanimous opinion of the Board that no other question affecting the public health is of such vital importance, and that the Legislature should be urged to make an appropriation liberal enough to prosecute the work of the committee with the utmost vigor.

*New York City*, 1,995,000: Total deaths reported for December, 3286—1219 under five years. Death-rate, 19.41. Zymotic diseases, per 1000 from all causes, 131.75; *diphtheria* (and croup), 176; *typhoid-fever*, 36; *consumption*, 419. Deaths from *diphtheria* (and croup) during the five weeks ending February 15th, 240; *measles*, 118.

January 21st the Sanitary Code was amended as follows:

*To License Milk Dealers.*—No milk will be received, held, kept, offered for sale, or delivered in the city of New York without a permit in writing from the Board of Health, and subject to the conditions thereof.

The amendment went into effect February 4th. All dealers, whether dairymen, grocers, or delivery-wagon men, will be required to obtain permits.

*Against Indiscriminate Spitting.*—Resolutions framed by Drs. Prudden and Biggs, bacteriologists, regulating expectoration in public conveyances and in public buildings. The new law requires that notices be posted in all public places warning persons against expectorating on the floors.

Municipal authorities and surface and elevated railway com-

panies will be required to provide proper receptacles for expectorations, and they must be kept thoroughly clean.

*Prohibiting the common use of knives, forks, and spoons on free-lunch counters in saloons. The resolution also prohibits the use of roller towels in the lavatories of saloons and restaurants and other public places. Towels in common use at saloon bars are also prohibited.*

*Brooklyn*, 1,100,000: Total deaths reported for December, 1986—677 under five years. Death-rate, 21.53. From zymotic diseases per 1000 from all causes, 165.00; *diphtheria* (and croup), 208; *typhoid-fever*, 20; *consumption*, 195. Deaths from *diphtheria* (and croup) during the five weeks ending February 15th, 180; *measles*, 68.

Owing to the indifference of the Board of Estimate to the dissemination of infectious clothing, bedding, etc., the Health Commissioner has been constrained to suspend the use of the steam disinfecting plant for the need of funds. For the same reason, the plan of house to house disinfection by means of corrosive sublimate and bread-rubbing will not be continued in 1896 except in special cases. The use of sulphur and steam fumigation in the prevention of the spread of diphtheria is reverted to. "Experiments are now being made in the use of formaldehyde as a bactericide, and it is probable that, in the near future, two or three wagons, with trained disinfectors, will be employed in this and other disinfection work." But no action yet appears against the exposure of food of all kinds to street dust by the grocers throughout the city.

*Syracuse*, 95,000: Total deaths for December, 111—24 under five years of age. Death-rate, 14. From zymotic diseases per 1000 deaths from all causes, 126.10; *consumption*, 12; *typhoid-fever*, 6; *scarlet-fever*, 5. During the last month scarlet-fever has become epidemic.

*The garbage question*, which has been in contention for several months, appears to be at last settled. January 28th the Board awarded a contract for six years for $126,000 to Daily & Aldrich. The contractors are to erect two crematories, one on either side of the Erie Canal, and collect the garbage much more frequently than has been hitherto done.

*Albany*, 100,000: Total deaths for December, 268—99 under five years. Death-rate, 31.40. Zymotic diseases per 1000

deaths from all causes, 354; *diphtheria*, 6; *typhoid fever*, 21; *consumption*, 28.

*Buffalo*, 335,709: Deaths reported for December, 326—91 under five years. Death-rate, 11.65. From zymotic diseases per 1000 deaths from all causes, 168.75; *diphtheria* (and croup), 33; *typhoid-fever*, 11; *consumption*, 50.

*Rochester*, 160,000: Deaths reported for December, 194—22 under five years. Death-rate, 13.00. From zymotic diseases per 1000 deaths from all causes, 63.10; *diphtheria* (and croup), 4; *typhoid-fever*, 3; *consumption*, 30.

*Elmira*, 30,000: Total deaths for December, 29—2 under five years of age. Death-rate, 12.00. From zymotic diseases per 1000 deaths from all causes, 130; *typhoid-fever*, 2; *diphtheria*, 2; *consumption*, 4.

During the last two months there has been an epidemic of *typhoid-fever*. The Health Officer reports, February 17th, that: "Since January 3d there have been 207 cases, with 19 deaths. The Chemung River, which supplies the city with water, is the polluted source of the fever. The disease has not reached its limit."

*Niagara Falls*, 16,000, February 8th: *Typhoid-fever* is epidemic, there being (Buffalo *Express*, February 9th) now no fewer than 120 cases. What the cause of this outbreak is it is difficult to say, but probably impure water.

NORTH CAROLINA.—George G. Thomas, M.D., President, Salem; Richard H. Lewis, M.D., Secretary, Raleigh.

January *Bulletin* summarizes the reports of 80 counties for December. The principal diseases, named in the order of their greater prevalence, were typhoid-fever, measles, whooping-cough, influenza, pneumonia, diphtheria, scarlatina, bronchitis. Of 26 towns with an aggregate population of 87,272 white and 61,913 colored, the number of deaths respectively was 81 and 107. The death-rates were, whites, 11.1; colored, 20.7: 15.1. The prevailing causes were, *consumption*, 24—15 colored; *pneumonia*, 24—15 colored; *diarrhœal diseases*, 68—44 colored; brain diseases, 14—2 colored; heart diseases, 19—9 colored. Deaths under five years of age, 53—37 colored.

OHIO.—Byron Stanton, M.D., President, Cincinnati; C. O. Probst, M.D., Secretary, Columbus.

*Cincinnati*, 350,000: J. W. Prendergast, M.D., Health Officer, reports for January: Deaths, 598—40 under five years of age. Death-rate, 20.50 per 1000. From *diphtheria* (and croup), 13; *typhoid-fever*, 34; *consumption*, 61.

*Cleveland*, 330,279: J. L. Hess, M.D., Health Officer, reports for January: Deaths, 351; from *diphtheria* (and croup), 18; *typhoid-fever*, 5; *consumption*, 44. Death-rate, 12.52.

*Toledo*, 120,000: J. T. Woods, M.D., Health Officer, reports for December: Deaths, 122—9 under five years of age. Death-rate per 1000, 12.2. *Diphtheria* (and croup), 2; *typhoid-fever*, 1; *consumption*, 14.

*Small-pox* was reported (Cincinnati *Enquirer*) February 13th at Louisville, 1 case only, but others have been exposed, and an increase is feared. Martin's Ferry is now without a case. There have been 73 cases, all told, since the outbreak of the disease here, and the maximum number reported at one time was on December 22, when there were 52 cases.

PENNSYLVANIA.—S. T. Davis, M.D., President, Lancaster; Benjamin Lee, M.D., Secretary, Philadelphia.

*Philadelphia*, 1,188,793: Theodore B. Stulb, Health Officer, reports: In the five weeks ending February 1st, deaths reported, 2501—896 under five years of age. Death-rate, 21.22. Deaths from *diphtheria* (and croup), 165; *typhoid-fever*, 34; consumption, 263.

At the annual meeting of the Board, January 28th, Chief Medical Inspector Taylor presented his annual report. It shows that there had been 3853 cases of *diphtheria* (and croup), 1195 cases of *scarlet-fever*, 2748 cases of *typhoid-fever*, 309 cases of *small-pox*, 12 cases of *cerebro-spinal meningitis*, and 1 case of typhus-fever reported to his office during 1895.

*Typhoid-fever* in Allegheny.—"It is disheartening (Pittsburg *Dispatch*, February 1st) to contemplate a total of 223 deaths in one year by a preventable disease out of a total population of 120,000—an average of 1 person out of each 531.1. But that is not all. A total of 1764 cases of the disease were reported, or 1 out of every 68 persons in the city a sufferer from this cause—1 to every 15 families."

SOUTH CAROLINA.—J. R. Bratton, M.D., Chairman, Yorkville; H. D. Fraser, M.D., Secretary, Charleston.

*Charleston*, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M.D., Health Officer, reports for five weeks ending February 1st: Deaths, 155—105 colored. Under five years, 48; deaths from consumption, 19. Annual death-rates, white, 17.94; colored, 30.8.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville; J. Berrien Lindsley, M.D., Secretary, Nashville.

*Bulletin* for January 20th reports the principal diseases, named in the order of their greater prevalence in the State for the month of December, were lung diseases acute, typhoid-fever, consumption, malarial-fever, whooping-cough, scarlet-fever, *la grippe*, rheumatism, measles, diphtheria, chicken-pox, erysipelas, small-pox, and mumps.

Statistics of the larger cities for the year 1895:

*Chattanooga:* White, 2700; colored, 13,000: 40,000. Deaths, 435; death-rates: white, 7.33; colored, 18.23.

*Clarksville:* White, 5000; colored, 3000: 8000. Deaths, 85; death-rates: white, 7.20; colored, 16.33.

*Columbia:* White, 3000; colored, 2320: 5229. Deaths, 60; death-rates: white, 9.97; colored, 12.93: 11.25.

*Knoxville:* White, 32,704; colored, 10,000: 42,704. Deaths, 235; death-rates: white, 4; colored, 10.

*Memphis:* White, 28,064; colored, 27,859: 55,923. Deaths, 1469; death-rates: white, 24.80; colored, 27.74.

*Murfreesboro:* White, 3000; colored, 2000: 5000. Deaths, 87; death-rates: white, 9.66; colored, 29.00.

*Nashville:* White, 54,595; colored, 33,159: 87,754. Deaths, 1816; death-rates: white, 15.42; colored, 29.37.

*Memphis*, 55,923—white, 28,064; colored, 27,859: J. J. McGowan, M.D., Secretary of the Board of Health, reports for January: Deaths, 90—white, 37; colored, 53. Annual rate per 1000 during the month, including non-residents—white, 15.82; colored, 22.83; total, 19.51. Annual rate per 1000 during the month, residents only—white, 8.94; colored, 16.80; total, 12.88. Contagious diseases reported during the month: *Small-pox*, 20; *scarlet-fever*, 14; *diphtheria*, 2.

UTAH.—*Salt Lake City*, 48,076: William T. Dalby, M.D., Commissioner, reports for January: Deaths, 37—7 under five

years of age. Deaths from *scarlet-fever*, 2; *consumption*, 2. Annual death-rate, 6.34 per 1000.

WASHINGTON.—*Seattle* (*Post-Intelligencer*): Health Officer Palmer reports for 1895: Deaths, 425. The death-rate per 1000 population, estimated 60,000, was 7.08, as compared with 7.78 in 1894.

Chief causes of death and number: *Typhoid-fever*, 24; *scarlatina*, 7; *diphtheria* (and croup), 5; consumption, 33.

WISCONSIN.—Solon Marks, M.D., President, Milwaukee; U. O. B. Wingate, M.D., Secretary, Milwaukee.

*Milwaukee*, 255,000: H. E. Bradley, M.D., Commissioner, reports for January: Deaths, 308—137 under five years of age. Annual death-rate, 14.49 per 1000. Deaths from *diphtheria* (and croup), 28; *typhoid-fever*, 6; *consumption*, 26. *Cases* of diphtheria reported, 95; typhoid-fever, 23; scarlet-fever, 18.

*Small-pox* is reported in *Waukesha*.

January 27th (Milwaukee *News*).—Dr. Walter A. Kemster was reinstated as Health Commissioner this morning.

THE CAUSES OF DEATH.—According to the census of 1890, of every 10,000 deaths in the United States one will be from calculus, 35 due to Bright's disease, 59 to rheumatism, 70 to scrofula, 130 to cancer, 140 to apoplexy, 148 to whooping-cough, 160 to dysentery, 190 to meningitis, 220 to scarlatina, 246 to ague, 250 to convulsions, 310 to typhoid-fever, 40 to fevers other than typhoid, 350 to heart trouble, 480 to diphtheria, 880 to diarrhœa, and 1420 to phthisis. Of this number 2210 are from typhoid, diphtheria and phthisis, all of which are preventable, and if we take in whooping-cough, dysentery, scarlet-fever, and diarrhœa, we shall have more than one third of all deaths at the present time from preventable causes.

MORTALITY STATISTICS ABROAD FOR THE YEAR 1895.

Population, total motality, annual death-rate per 1000, and deaths from small-pox and diphtheria.

London, 4,392,346; 86,879; 19.8; 55; 2420. Glasgow, 695,876; 16,300; 23.4; 27; 211. Manchester, 524,865; 13,208; 25.2; 2; 106. Liverpool, 503,967; 14,477; 28.7; 13; 119. Birmingham, 496,751; 10,048; 20.2; 9; 183. Leeds,

395,546; 8073; 20.5; 0; 65. Dublin, 349,594; 9819; 28.1; 121; 50. Sheffield, 342,768; 6994; 20.4; 0; 52. Edinburgh, 273,535; 5660; 20.7; 19; 111. Belfast, 273,277; 7068; 25.9; 0; 34. Bristol, 228,139; 4109; 18.0; 0; 34. Nottingham, 226,658; 4299; 19.0; 0; 10. Bradford, 226,384; 4483; 19.8; 0; 20. Hull, 216,722; 4508; 20.6; 2; 37. Salford, 208,253; 5327; 25.6; 0; 61. Newcastle, 207,021; 4229; 20.4; 0; 52. Portsmouth, 174,751; 3109; 17.8; 0; 19. Norwich, 107,127; 2066; 19.3; 0; 19. Amsterdam, 451,493; 7833; 17.3; 3; 84. Rotterdam, 272,042; 5281; 19.4; 38; 30. The Hague, 180,455; 3387; 18.8; 0; 38. Paris, 2,424,-705; 51,451; 21.2; 16; 421. Lyons, 438,077; 9167; 20.9; 0; 71. Lille, 200,325; 5581; 27.9; 1; 46. St. Étienne, 133,-443; 2924; 21.9; 0; 16. Nantes, 125,029; 2961; 23.7; 7; 20. Havre, 116,369; 3309; 28.4; 5; 30. Rouen, 111.847; 3688; 33.0; 43; 144. Rheims, 105,408; 2744; 26.0; 0; 34. Nice, 97,720; 1945; 19.9; 1; 13. Nancy, 90,748; 2306; 25.4; 1; 22. Limoges, 72,697; 1883; 25.9; 0; 17. Besançon, 54,636; 1212; 22.2; 0; 1. Pau, 33.111; 636; 19.2; 1. Berlin, 1,820,340; 33,177; 18.2; 0; 974. Hamburg, 608,710; 11,704; 19.2; 1; 134. Leipzig, 414,023; 8525; 20.6; 0; 312. Munich, 396,000; 10,284; 26.0; 0; 208. Breslau, 367,-769; 10,093; 27.4; 0; 237. Dresden, 320,600; 6559; 20.5; 1; 167. Cologne, 314,000; 7196; 22.9; 0; 175. Magdeburg, 241,389; 4773; 19.8; 0; 302. Frankfort, 203,332; 3791; 18.6; 0; 65. Düsseldorf, 171,638; 3899; 22.7; 0; 57. Königsberg, 171,305; 4508; 26.3; 0; 100. Nuremberg, 167,-982; 3573; 21.3; 0; 61. Chemnitz, 164,744; 4816; 29.2; 0; 109. Altona, 158,782; 2993; 18.8; 0; 38. Elberfeld, 141,-189; 2353; 16.7; 0; 53. Stuttgart, 135,594; 2481; 18.3; 0; 60. Stettin, 131,523; 3684; 28.0; 0; 61. Barmen, 128,129; 2059; 16.1; 0; 70. Dantzig, 125,412; 3183; 25.4; 0; 45. Crefeld, 119.254; 2009; 16.8; 0; 52. Halle, 119,203; 2578; 21.6; 0; 107. Aix-la-Chapelle, 110,570; 2618; 23.7; 0; 45. Essen, 91,209; 1956; 21.4; 0; 50. Metz, 65,791; 1097; 16.7; 0; 11. Berne, 48,328; 1023; 21.2; 0; 13. Basle, 78,860; 1403; 17.8; 0; 56. Geneva, 80,111; 1628; 20.3; 0; 9. Lausanne, 36,619; 677; 18.5; 0; 5. Zurich, 126,497; 2083; 16.5; 0; 24. Chaux de-Fonds, 31,173; 607; 19.5. Vienna, 1,495,764; 34,435; 30.0; 3; 681. Buda-Pesth, 566,022; 14,-

650; 25.9; 12; 258. Prague, 343,822; 7157; 20.8; 1; 72. Trieste, 160,825; 4841; 30.1; 2; 266. Brünn, 99,060; 2628; 26.5; 1; 49. Linz, 50,082; 1563; 31.2; 0; 50. Copenhagen, 333,714; 6150; 18.4; 0; 113. Stockholm, 259,304; 4398; 17.0; 0; 59. Gothenburg, 111,209; 1811; 16.3; 0; 95. Christiania, 167,588; 2936; 17.5; 0; 46. Helsingfors, 68,132; 1248; 18.3; 0; 21. St. Petersburg, 954,400; 27,379; 28.7; 84; 696. Moscow, 753,469; 26,771; 35.5; 31; 645. Warsaw, 515,654; 12,190; 23.6; 30; 236. Odessa, 324,500; 7851; 24.2; 46; 115. Turin, 344,203; 7052; 20.5; 5; 80. Venice, 158,159; 3598; 22.7; 0; 39. Bologne, 146,785; 3177; 21.6; 0; 43. Lisbon, 301,206; 9381; 31.1; 148; 90. Cairo, 533,188; 17,233; 48.8; 70; 71. Alexandria, 181,703; 7571; 41.7; 18; 81. Damiette, 43,502; 838; 19.3; 6; 5. Suez, 12,406; 575; 46.3; 2. Port Said, 10,693; 611; 57.1; 0; 3. Brussels, 187,924; 3953; 21.0; 0; 39. Anvers, 256,620; 4726; 18.4; 14; 74. Liége, 160,848; 2776; 17.3; 0; 11. Gand, 155,746; 3604; 23.1; 1; 2. Malines, 53,369; 993; 18.6; 0; 28. Verviers, 51,196; 810; 16.0; 0; 12. Bruges, 49,342; 936; 19.0; 0; 31.

## OBITUARY.

JAMES EDMUND REEVES died at his home in Chattanooga, Tenn., January 4th, 1896. He was the son of the Rev Josiah Washington and Nancy Mosee (Kemper) Reeves, grandson of Thomas Washington Reeves, was born April 5th, 1829, in Amissville, Rappahannock County, Va. Obliged to assist his father, who was a tailor, his early education was neglected, and he had to leave school at the age of fourteen; but he was determined to gain more knowledge, and by extra work made money with which to purchase books. At the age of nineteen he commenced the study of medicine with Dr. Elam D. Talbott, at Philippi, Va., and after one year's instruction under this preceptor, he went to New Market, Va., and became the pupil of Dr. Jacob Neff. Here he was given every possible opportunity to study disease at the bedside, and frequently had charge of patients. In the spring of 1850 he opened an office at Sutton, the county seat of Braxton County, now West Virginia, and by the following October had earned

enough money from his practice to enable him to attend a course of lectures at Hampden Sydney Medical College, Richmond, Va. His second course of medical lectures was at the University of Pennsylvania, and he was graduated from that institution in 1860. He remained one year at Braxton Court House, after that nine years at Philippi, seven years at Fairmount, twenty years at Wheeling, W. Va., and for the past five years and a half at Chattanooga, Tenn. Soon after settling at Wheeling he began to agitate the subject of municipal hygiene, and secured the passage of an ordinance establishing a city health department. In 1869 he was elected city health officer and county physician, which office he held four years. Subsequently he was elected a member of the city council, and served four years. He was one of the founders of the American Public Health Association, of which he was president in 1885. In 1867 he prepared and sent out the call for the establishment of the State Medical Society, of West Virginia, and was elected its first secretary, and in 1881 chosen its president. He was one of the Executive Committee, for West Virginia, of the International Medical Congress, in Philadelphia, 1876. In 1882 he was elected a member of the Judicial Council of the American Medical Association. In 1884 he was elected an honorary member of the Connecticut State Medical Society. For many years he has been a corresponding member of the Pathological Society of Philadelphia, was one of the vice-presidents of the Section of Public and International Hygiene of the International Medical Congress, Washington, D. C., 1887; vice-president of the American Microscopical Society, 1886; member of Advisory Council Pan-American Medical Congress, also Demonstrator of Pathological Histology, at the meeting in Washington, September, 1893. He was a member of the Association of American Physicians, was the author of the law creating the State Board of Health of West Virginia, of which he was a member, and its secretary for five years. He was employed by the State Board of Health of Tennessee to make sanitary inspections of the State's defences against yellow-fever during the Jacksonville epidemic of 1888. He was particularly interested in microscopic investigations, and has devised sundry microscopic appliances.—*Physicians and Surgeons of America.*

## NEW BOOKS AND BOOK REVIEWS.

DRINKING WATER: L'EAU POTABLE, par F. COREIL, directeur du Laboratoire municipal de Toulon. 1 vol. in-16 de 359 pages, avec 135 figures, cartonné (*Encyclopédie de chimie industrielle*). 5 fr. Librairie J. B. Baillière et fils, 19 Rue Hautefeuille, près du Boulevard Saint-Germain, à Paris.

The subject of this book has attained such a degree of importance that a great number of reports, essays, and books have been published on it during recent years; but as none of them treat of it in a way at once succinct and complete, this work is submitted as a summary of all that is essential to a correct knowledge of the subject, deduced from extensive personal observation and practical results obtained from detailed laboratory work. That the work will prove very useful to all who would familiarize themselves with the results that have been worked out by the study of drinking water and a useful handbook in the laboratory is beyond question.

Bacteriology has so enriched the subject with new facts during recent years, that the researches of chemists are no longer deemed sufficient. Now that it is desirable to know thoroughly the qualities of water, it is not sufficient simply to make a chemical analysis, but biological demonstrations and micrographical tests must be made, the difficulties of which are known to all who have undertaken them.

The methods of improving and of purifying water have also been made studies of utmost importance, and have been brought to a degree of perfection which are described in the present treatise.

The subject is divided into five parts:

In the first the author examines the different elements of drinking water; the relation of water to diseases, and the properties of different kinds of drinking water.

The second treats of the chemical analysis.

The third treats of the microscopical analysis of water.

In the fourth he studies the bacteriological and biological analyses of water.

Finally, in the fifth, he passes in review the best-known methods of proceeding for imptoving or sterilizing water.

SYPHILIS IN THE MIDDLE AGES AND IN MODERN TIMES. By DR. F. BURET, Paris, France. Translated from the French, with notes, by A. H. OHMANN-DUMESNIL, M.D., Professor of Dermatology and Syphilology in the Marion Sims College of Medicine; Consulting Dermatologist to the St. Louis City Hospital, to the St. Louis Female Hospital; Physician for Cutaneous Diseases to the Alexian Brothers' Hospital; Dermatologist to Pius Hospital, to the Rebekah Hospital, to the St. Louis Polyclinic and Emergency Hospital, etc. Being Vols. II. and III. of "Syphilis To-day and Among the Ancients," complete in three volumes. 12mo, 300 pp. Extra cloth, $1.50 net. Philadelphia: The F. A. Davis Co., Publishers, 1914–1916 Cherry Street.

This should be a very welcome book to busy practitioners and medical students who would review the history of one of the most important and, unfortunately, prevalent diseases, together with a lucid sketch of its pathology, treatment, and prophylaxis in the nineteenth century. It is, in short, a concise historical review of the subject, with measures for its cure and prevention from most ancient times to the present day, deduced from an immense amount of standard literature, summed up under the light of modern progress and rendered practical.

PROCEEDINGS OF THE CONNECTICUT MEDICAL SOCIETY, 1895. N. E. WORDEN, M.D., Secretary, Bridgeport, Conn.

A volume of nearly four hundred pages, comprehending twenty odd papers and reports on sanitary and medical subjects, of practical importance to all physicians and sanitarians; to which is appended a list of members. The opening address of the President, Dr. Francis N. Braman, lays special stress on needful legislation, both national and State, for the protection of the public health. Typhoid-fever is the subject of several papers and considerable discussion, strengthening the propositions of the presidential address with many illustrations of the waste of life consequent upon neglected sanitation and power to enforce it. Diphtheria and serumtherapy is the subject of a lucid committee report, by Drs. J. W. Lyon, F. H. Wiggin, and C. B. Graves, and a comprehensive paper by Professor William H. Welch, of Johns Hopkins University.

Dr. F. W. Wright, Health Officer of New Haven, has a brief paper on the "Defence of Health Boards," showing the political relations and the need of more strenuous and unanimous support by the medical profession in order to render them effectual. Altogether the volume is of exceptional value and utility to sanitarians, as compared with the proceedings of medical societies generally, and especially creditable to the Connecticut Medical Society for the foreground aspect of preventive medicine in its deliberations.

TRANSACTIONS OF THE MEDICAL SOCIETY OF NORTH CAROLINA FOR 1895. ROBERT D. JEWETT, M.D., Secretary, Wilmington, N. C.

A pamphlet of 230 pages, comprehending thirty-three papers, some of them very brief, on medical and sanitary subjects; and, as usual, Conjoint Session with North Carolina Board of Health. The chief subject of the opening address of the President, Dr. John H. Tucker, was preventive medicine—quoting the late Samuel D. Gross—for its justly recognized pre-eminence as a specialty in the comprehensive field of medical sciences. Accepting this estimate, he sums up the past, present, and prospective advantages of preventive medicine to the State and nation, as it has been, is and *should be* in the protection of the health of the people. The Conjoint Session was presided over by Dr. George G. Thomas, President of the Board of Health. Dr. R. H. Lewis, the Secretary, read his report, summarizing the work of the Board, its prospects and needs. The chief subject of discussion was water supply, with special reference to the Secretary's paper on "Drinking Water in its Relation to Malarial Diseases," 1894 (SANITARIAN, Vol. XXXIII., p. 496), and the result of inquiries which it elicited. The paper appears to have been eminently fruitful in practical results, intensifying observation and the promotion of the public health.

A MODEL PUBLIC BATHING ESTABLISHMENT.—Report of the Selectmen of Brookline, Mass., comprehending the details on the report of a committee appointed by the town, last summer, on Improved Bathing Facilities. The committee consisted of three—Dr. Chase, the local health officer; James

B. Hand, a master mechanic, formerly a member of the Board of Health; and a public-spirited lady and practical philanthropist, Mrs. Martha W. Edgerly, who is one of the overseers of the poor. The plan approved of, and for which appropriation has been made, provides for a suitable brick building, containing a sufficient number of the best sort of baths (twelve rain baths and three tub baths, with space for more in the future), a swimming-tank, 80 feet by 26 feet, finished throughout of white glazed brick; a tank 22 feet by 10 feet, of the same material, for instruction in swimming when the large tank is empty and floored over; a sufficient number of dressing-rooms, toilet-rooms, a small steam laundry, steam heating, ventilation, plumbing, etc., and two large unfinished rooms up-stairs in the head house that will be useful as meeting-rooms, for lockers and other purposes, while the large tank room, when floored over in winter, will afford a better place for gymnasium work and drill for the school-boys than any other building now available.

## CONTEMPORARY LITERATURE.

"THE PROGRESS OF THE WORLD," the editorial department of the *Review of Reviews*, is especially live and vigorous in the February number. Its paragraphs are packed with information about Venezuela, British Guiana, South Africa, and Canadian politics, to say nothing of its comment on the American financial situation and other matters of immediate national importance. The department is illustrated with the usual number of timely portraits and maps. The article on the recent Turkish massacres is the most telling and effective exposure yet published. It is based upon full accounts of the massacres, written on the ground by trustworthy and intelligent persons—French, English, American, Turk, Kurd, and Armenian—who were eye-witnesses of the terrible scenes. The article estimates the number of killed in the massacres thus far at 50,000, the property destroyed at $40,000,000, and the number of starving survivors at 350,000.

HARPER'S MAGAZINE for February opens with an attractive article on Baltimore, by Stephen Bonsal, one of the best

known of that city's younger sons. The rapid growth and importance of Western municipalities has sometimes overshadowed in popular estimation the equally remarkable advance made by Eastern cities, of which Baltimore is one of the most enterprising and prosperous. Many illustrations have been made for Mr. Bonsal's article by Harry Fenn, and from photographs.

CHICAGO'S WONDERFUL GROWTH.—In the seventeenth century the present site of Chicago was a swamp, which fur-traders and missionaries found fatally miasmatic. About 1800 a government engineer, viewing that rank morass traversed by a sluggish stream, pronounced it the only spot on Lake Michigan where a city could *not* be built. In 1804 Fort Dearborn was erected here to counteract British influence. In 1812 the fort was demolished by Indians, but in 1816 rebuilt, and it continued standing till 1871. Around the little fort in 1840 were settled 4500 people. The number was 30,000 in 1850; 109,000 in 1860; 300,000 in 1870. In 1880 the community embraced 503,185 souls; in 1890 it had 1,099,850. In 1855 the indomitable city illustrated her spirit by pulling herself bodily out of her natal swamp, lifting churches, blocks and houses from eight to ten feet, without pause in general business.—*From "A History of the Last Quarter-Century in the United States," by* PRESIDENT E. BENJAMIN ANDREWS, *in the March Scribner's.*

THE TERRIBLE AFRICAN FEVER.—During 1882 we built Kimpoko and Gobila stations, explored the Kwa and Mifini rivers, and discovered Lake Leopold II.; but on returning from this voyage I was attacked by a violent fever. It was my second experience of the dangerous hematuric type. I was unconscious for days, and on recovering my senses found that my legs had swollen to an immense size. For a month afterward it appeared to me as if a quarter of a hundred-weight of mercury had been injected into each leg.—"*The Story of the Development of Africa," by* HENRY M. STANLEY, *in the February Century.*

THE first adequate description of life in the Colorado Health Plateau, with its varied social aspects, is given by Lewis Morris Iddings in the February *Scribner's.* He writes from a wide

experience gained by residence in European and American health resorts, and speaks with the greatest enthusiasm of the social side of the life around Colorado Springs, as well as of its wonderful benefit to invalids. An artist was sent by *Scribner's* to the region for the express purpose of making these illustrations from nature.

HOME TREATMENT.—It is a safe assertion to make, that we all have our faults. But when we come to analyze the generalization, and sort out individual shortcomings for examination, it is not so safe to assume that we all recognize where our weaknesses lie. It is also true that our enemies do not tell us our faults, but only discuss them behind our backs; while our friends shrink from the thankless task of holding the mirror up to our foibles, for fear of alienating us in the process. Burns's wish may be wise indeed:

> "O wad some power the giftie gie us
> To see oursels as ithers see us!"

but, since friends and enemies are alike unavailable, where shall we find the discipline we need?

The answer is plain, though we generally shut our eyes to it. The one place where we meet the plain-spoken criticism that is necessary to self-knowledge is the home circle. If there is any fault, sprouting or full blown, developing or developed in us, we will learn it here; and, since the motive of the critic is sincere affection and a desire to repress whatever is imperfect in our character, we should accept these rebukes with thanksgiving, and not with impatience, as often happens.

It may, and usually does, fret and irritate us to have our vanity wounded by the unsparing remark that our temper, for instance, is disagreeable, or that we grumble and worry unnecessarily, or that our ways are selfish and inconsiderate, or our wills inordinately strong, or that we dress too youthfully, or exaggerate in our talk, or that certain of our habits are too fixed for other people's comfort, etc. We may call ourselves "shy," perhaps, and be hurt (and enlightened) by hearing it dubbed "self-consciousness" by a clear-sighted relative. The very fact that we fret at such revelations shows that we recognize the imperfection even when we refuse to acknowledge it

to ourselves. Nothing is so invaluable as an unsparing and near relative in these matters—so near that his or her wholesome counsel cannot be successfully evaded, and so unsparing that no fault goes unwhipped of justice.—*From Harper's Bazar.*

APPLETON'S POPULAR SCIENCE MONTHLY FOR FEBRUARY, 1896, sustains its excellence. In the instalment of his *Principles of Taxation* in this number, David A. Wells describes the tax systems of China and Japan, and shows that taxation has received scant attention in history or literature. Two articles by Herber Spencer appear this month; one in his series on *Professional Institutions*, tracing the origin of the *Sculptor*, the other being a reply to objections raised by the Marquis of Salisbury against the doctrine of evolution. Professor H. C. Bolton concludes his account of *The Smithsonian Institution* with a description of its current activities, illustrated with views and portraits. Under the title *The Study of Inheritance*, Professor W. K. Brooks contributes the first part of an examination of the doctrines set forth by Francis Galton, taking issue with Mr. Galton on some points. Other illustrated articles are *Gathering Naval Stores*, in which the mode of obtaining turpentine, rosin, etc., is told by Lee J. Vance, and *Natural Features of Venezuela*, a timely descriptive article by Frederik A. Fernald. As illustrated also, though not in a high style of art, we must count Professor Sully's examination of the drawings of children and savages, taken from advance sheets of his forthcoming book, "Studies of Childhood," much of which has appeared in the *Monthly*. Dr. Charles C. Abbott contributes some of his observations as to *The Effect of Prolonged Drought upon Animal Life;* Edmund Noble discusses *Imitation among Atoms and Organisms;* Professor William R. Newbold adds a chapter on *Disordination and Inco-ordination* to his series on Suggestibility and Kindred Phenomena, and Dr. Nathan Oppenheim advocates measures to prevent the multiplication of criminals. The subject of the usual biographical *Sketch* and *Portrait* is this month a man prominent in affairs as well as in scientific thought, Hon. Andrew Dickson White, first President of Cornell, ex-minister to Germany and to Russia, and now a member of the Ven-

ezuelan boundary commission. New York: D. Appleton & Company. Fifty cents a number, $5 a year.

A JOLLY OLD TAR.—The captain of a certain large sailing-vessel insists upon being addressed as "Sir" by every one on board. One day a new hand joined the ship, and a short time after leaving harbor, being a well-seasoned old salt, he was intrusted with the wheel. The captain came up and put the usual question, "How's her head?"

"Nor'-by-east," answered the old tar, very gruffly, taking the customary hitch in his trousers.

"My man," suavely answered the captain, "on this craft, when one of the crew speaks to me, he gives me a title of respect. Don't you think you might do so, too? Now, how's her head?"

"Nor'-by-east, I tell yer," shouted the tar, displaying not a little irritation.

"I'm afraid you don't quite understand me," responded the captain, good-humoredly. "Let me relieve you at the wheel, and then do you take my place and ask me the question. I will then show you how it should be answered."

They accordingly changed places.

"'Ow's her 'ead?" roared the tar.

"Nor'-by-east, sir," replied the captain, with gentle emphasis on the "sir."

"Then keep her so, my man, while I goes forrard and has a smoke," was the startling rejoinder from the old reprobate, who calmly commenced to suit the action to the word, and disappeared up by the forecastle, lighting a match as he went. —*Harper's Round Table.*

THE PLAGIARIST is a particularly live animal in the multiplicity of new periodicals that come to our table. Usually he attempts to hide his stealing by changing a line or two, or a title. Now and then, however, he gulps down the whole of a nugget to his liking, or follows the bad example of a few respectable, though careless journalists, by adding *ex* or *sel*, as a lubricant, rather than the name of the robbed, lest the reader be referred to a better source of knowledge. "Ex" and "sel" should be eschewed by every respectable writer,

journalist or otherwise. Their use is offensive to the authors or sources of all articles to which they refer, and an encouragement to literary thievery.

DEAD BEATS.—Bill Nye once said in a lecture: "A man may use a wart on the back of his neck for a collar button; ride on the back coach of a railroad train to save interest on his money until the conductor comes around; stop his watch nights to save the wear and tear; leave his 'i' or 't' without a dot or cross to save ink; pasture his mother's grave to save corn; but a man of this kind is a gentleman and a scholar compared to a fellow who will take a newspaper or magazine, and when asked to pay for it puts it in the office and has it marked 'refused.'"

## ANNOUNCEMENTS.

THE INTERNATIONAL MEDICAL ANNUAL.—The volume for 1896 will contain, as have the previous issues, a review of therapeutics for the year, together with descriptive articles on the new remedies, with clinical indications for their use; a dictionary of new treatment, giving a complete index of diseases and showing the latest methods of treatment, both medical and surgical, in a series of specially prepared articles and reviews from the pens of thirty-nine eminent members of the profession, on subjects with which their names are specially associated. The present edition promises to surpass in wealth of material any of its predecessors. The volume is copiously illustrated by colored plates and photographic reproductions in black and white. E. B. Treat, Publishing Office 5 Cooper Union, New York.

RÖNTGEN'S RAYS.—A beautiful supplement to No. 441 of the Chicago *Open Court* gives the first distinct specimen produced in this country of Röntgen's new method of photographing through opaque substances. It is a photograph of the interior of a living, human hand, and shows distinctly every outline of the skeleton. The work is from the Hamburg Laboratory, Germany, and is said to surpass that of

Professor Röntgen himself. The cut is accompanied by an article which explains in a popular manner the details and scientific character of the new method. The same number contains an article by a well-known publicist, ex-Governor Koerner, on Mr. Gilman's view of the Monroe Doctrine, comments on religious and secular questions by Dr. Carus, and a poem of remarkable merit by Charles Alva Lane. The Open Court Publishing Co., Chicago. Five cents a copy; $1 a year.

SANITARY PATENTS OF RECENT ISSUE SPECIALLY REPORTED FOR "THE SANITARIAN" BY E. S. DUVALL, JR., PATENT ATTORNEY, WASHINGTON, D.C.

550,544. Filter. A. D. Strong, Ashtabula, O.

550,270. Process of and apparatus for treating garbage. B. F. Howland, Philadelphia, Pa. Consists in first extracting the grease from the garbage in a closed vessel, floating the grease to the upper part of the vessel, directing the grease to a central discharge by the action of steam jets, withdrawing the grease therefrom, draining off the water, and drying the remaining mass by the application of heat.

550,323. Apparatus for treating garbage. E. Holthaus, Canarsie, N. Y. Comprises a horizontal cylindrical shell having suitable heads provided with stuffing-boxes, a rotary shaft with stirrers inside the shell, and one of the heads being provided with a chamber having a screen upon its inner side, and upon its outer side a series of grease pipes arranged at different levels and provided with cocks to open the same at pleasure.

550,583. Filter. George Brinckman, St. Louis, Mo.

550,597. Filter. Henry Deck, Philadelphia, Pa.

550,664. Apparatus for treating garbage. Charles Weeks, Philadelphia, Pa. Consists of a digester, a drier, a valved pipe communicating with the drier and extending through the top and terminating near the bottom of the digester, valved connections for introducing steam into said pipe, and valved connections for introducing steam at the top of the digester.

550,939. Water filtering apparatus. J. H. Blessing, Albany, N. Y.

# THE SANITARIAN.

## APRIL, 1896.

NUMBER 317.

## SANITARY BRUSHWOOD PICKED UP IN EUROPE.

By C. W. CHANCELLOR, M.D.

### No. VI.

### OYSTERS AND FEVER.

THE reports of the various medical men and experts composing the committee appointed to inquire into the cases of enteric-fever following what is known as the Stirling County Ball, in October last, have now been presented. Dr. Chalmers, the Medical Officer of Health for Glasgow, states that the oysters came from Holland, and an inquiry into the state of the beds from which they had been taken was instituted there by Dr. Sallet, Medical Officer of Health for the city of Amsterdam, and Dr. Van der Loeff, Medical Officer of Health for Zeeland and East Brabant. So far, all these tended to exonerate the oyster from any active share in the introduction of the enteric-fever virus, and confirmation of this impression was shortly forthcoming. As a general statement, he believed it to be in strict accordance with the facts, as we know them, that the cause of enteric-fever infection, which was unquestionably operative during the evening of the ball, was not in the oyster. Not the slightest evidence, it appears, had been discoverable pointing to contamination of the food supplies prior to their delivery at the ball on the evening in question. It had been stated, on the testimony of the oyster-opener, that those were in good condition when opened. They were opened, however, and until required kept in a small side corridor adjoining one of the principal lavatories, an exceedingly unhappy place for such a purpose. Indeed, it would seem

that some influence to which they were here exposed rapidly determined putrefactive changes in some of them ; for in several instances, when brought to the table, they were rejected on this condition being recognized.

### RÖNTGEN'S INVISIBLE RAYS.

Light that the human eye can take no note of Professor Röntgen, of Würzburg, has found can go through flesh and blood ; can, indeed, penetrate all sorts of substances hitherto regarded as opaque, and be made to print their images on the sensitive plate. Endless useful applications to science, and especially to surgery, instantly rose to view when this astonishing revelation was made ; but it appears that certain possible inconveniences have also to be considered. The bones of a hand by means of the new rays can be photographed in two minutes ; but before such a result can be obtained with the thicker portions of the body there must be a further development of the rays. To photograph the trunk would take from fourteen to twenty-four hours, and for a subject to remain quiet during such a prolonged period is a physical impossibility. Recently Professor Ramsey, the discoverer of argon, used the Röntgen method in an endeavor to ascertain the locality of a bullet which had entered the fleshy part of a man's leg. The sufferer exhibited much patience, but the rays were not powerful enough to effect the photography in a reasonable time. The great obstacle, it seems, to successful photographing through deep layers of flesh is the difficulty of making a good bulb or tube to produce the rays.

### ANOTHER STARTLING DISCOVERY IN OPTICS.

Highly sensational intelligence comes from Rome concerning the alleged invention of Professor Salvioni, of Perugia, which, if true, will revolutionize and considerably modify even certain social institutions. When Röntgen's discovery was announced, it was feared that civilized life would be hardly possible if perhaps the very coin in one's pocket could be photographed without one's knowing it. Yet there was one protection. It took a sensible time, as well as elaborate apparatus, to take a "snap shot" with the newest of lenses.

If, however, the story from Rome is confirmed, even these safeguards are swept away. Professor Salvioni read a paper before the Medical Academy on Röntgen's recent discovery, and described the instrument which he (Salvioni) has just invented, by means of which rays of invisible light are made to impart to the eye the capacity of seeing through all objects which those rays can penetrate, and of beholding the contents of opaque receptacles. Salvioni, not content with this description, is said to have produced his invention and shown the physicians the contents of a closed aluminum box.

The surgeon armed with this instrument would not need to photograph a part of the body to find where a bullet was lodged, but would see it directly. So far so good ; but, alas ! the pickpocket might discover by the same means just where the purse was and what were its contents. Worse than all besides, no one yet knows what substances are opaque. When mysterious rays pass through wood, brick, cloth, and even metal, not merely optics, but all social life is in danger of being revolutionized. To see the contents of a closed aluminum box may be extremely interesting, but it becomes positively appalling to think of all the possibilities that this power suggests. The next thing society will demand to know is what substances really are impermeable to the physicist's rays and to the eye of the savant ; we must at least have clothes that cannot be rendered transparent. The philosopher has sighed for transparency of character and soul, but nobody wishes to be seen naked.

### AN ELECTRIC HEATING PAD.

The fact that asbestos plays a remarkably useful part in electrical work is not generally recognized. For purposes of insulation this unique material meets the most exacting requirements, and its use by electricians is daily increasing. Its latest application is in the "electrotherm," the new device which has already begun to take the place of hot-water bottles in hospitals and invalid chambers. The electrotherm is a flexible sheet or pad, composed of asbestos, in which electric wires are imbedded. When these wires are connected to any source of electric current a constant and uniform degree of heat is generated. For this connection the socket of an elec-

tric lamp is ordinarily found most convenient, but where the lighting current is not available batteries can be used. The pad is found of great convenience in the relief of chilliness, cold feet, etc., as well as in cramps and other local pains, and in general hospital practice. By its use the risk and discomfort of frequent changes of temperature incident to the renewal of ordinary hot applications are entirely obviated without discomfort. It can be moistened without any injury, and it can be made to give the effect of a poultice or moist heat by being applied over one or more thicknesses of wet flannel. It can be used by any one with perfect safety, and its simplicity and convenience wherever the application of artificial heat is desired render it especially valuable for medical uses. The regulation of the temperature is effected by a conveniently placed switch.

### KISSING AND HAND-SHAKING.

As an abstract science the study of hygiene is becoming what the French call *une belle chose!* Not long ago scientists called attention to the dangers of kissing, the contact of the lips being considered a means of conveying contagious diseases; but it does not appear that the warning has had much effect in arresting the "barbarous practice," especially when a pretty woman, "on whose lips the mystic bee has dropped the honey of persuasion," invites the offering. This method of embracing has so long been a habit of expressing affection among our countrymen and countrywomen that it is not likely the compensations which it offers will be soon dispensed with at the cold suggestions of science or an unseemly fear of the deadly microbe. Not so with the French, however. They are always glad of a pretext to be a little more reserved than other people; they kiss the cheek, or forehead, and leave the rest to imagination. The labial microbe never reaches the Gallic goal except by an accidental "slip of the lip," or by migrations in the dark. A demoiselle who suffers herself to be saluted in the American fashion must marry the man who thus impresses her or be forever disgraced. Hence it is that engagements are held, among this polite people, to be as sacred as marriage itself.

In Russia, where hand-shaking has hitherto been considered

a harmless method of greeting, physicians have now called attention to the dangers of the practice as a ready method of disseminating dangerous microbes, and a society has been founded for the purpose of making a vigorous campaign against the usage, which is said to be a fruitful source of spreading disease. Microbes, they say, are so insidious that they are easily introduced into the human organism through the medium of hand-shaking, which, they contend, is a useless, undignified, and dangerous practice. Perhaps, after all, the Russian physician is more philosophical and practical than our unsympathetic, anti-kissing "cranks," who, having passed the age of sentiment, are anxious to erect a barrier of microbes between youth and beauty. Hand-shaking is simply a manifestation of cordiality which can be easily and no doubt advantageously dispensed with. It is easy to see how disease may be conveyed from one person to another by this method of salutation; but kissing, which we are told "goes by favor," is much more *recherché*, and, at the same time, much less likely to communicate disease, especially where the practice is confined to "two souls with but a single *lip*." It is necessary to take the world as we find it; we cannot play upon human weaknesses to blot out human emotions, which are the same to-day as when Leander swam the Hellespont to kiss Hero.

MORTALITY FROM TUBERCULOSIS IN GERMAN CITIES.

With considerable trouble Dr. Bollinger has succeeded in procuring the mortality tables of various German cities, extending over long periods, with the special intention of inquiring into the mortality from tuberculosis. From a comparison of the tables, it is certain that as regards the large cities, such as Vienna, Berlin, and Hamburg, a distinct diminution in the death-rate from tuberculosis is taking place. In the city of Munich, for instance, a diminution of 18 per 10,000 has taken place during the last twenty-six years. In correspondence with this, the tuberculous material in the Pathological Institute, it is said, has diminished, so that in the space of five years 8 per cent fewer cases of tubercle are met with on the *post-mortem* table. Formerly one third of all *post-mortem* examinations were on subjects that had died from

tuberculosis in some form, where they now number only one fourth. As regards the prevalence of tuberculosis in cattle, the doctor states that in one year 21,000 cattle found to be suffering from tuberculosis were slaughtered in the Berlin slaughter-houses, and that in the kingdom of Saxony one ox in seven and one cow in four were affected with tubercle. In the years 1893–94 a remarkable increase in tuberculosis in cattle took place in Schwerin, and this increase corresponded in a dearth of fodder for cattle. Dr. Bollinger mentions this fact as a wholesale experiment illustrating the effects of deficient nutrition in predisposing to disease.

Professor Delépine, writing on this subject, has shown that —taking very large numbers as the basis of his estimate—at least 16 per cent of cattle are affected with this disease ; and that whereas in some districts it may be comparatively rare, there are parts in which a non-tuberculous cow is the exception. Pigs, he says, are also affected in the same manner, although not to the same extent, about one in every thirty-six being attacked by the disease. Cats and dogs also are subject to the tuberculosis, and it is to be feared, from their exceeding friendliness, may be a source of danger to children with whom they play. Although the form of tuberculosis with which poultry are affected differs in some particulars from that of man, it is a very common disease, and commits great ravages in poultry yards. But any animal which conforms with man's habit of dwelling under artificial shelter is apt to contract tuberculosis, and so it is that, whether they be monkeys, camels, lions, tigers, foxes, etc., they all, according to Professor Delépine, are liable to tuberculosis when they are kept in menageries.

### SMALL POX IN DUBLIN.

In the report of the Local Government Board for Ireland for the year 1895 Mr. T. T. Stafford, the Medical Inspector for the Dublin District, presents an interesting and important paper on the small-pox outbreak. He notes that between 1871 and 1881 there were 2988 deaths from small-pox, while from 1882–93, both inclusive, only five deaths occurred. The outbreak of 1894 and 1895 was undoubtedly caused by a casual admitted to the North Dublin Union, who was, says

the report, within four days of his discharge, admitted to the Hardwick Hospital. Cases, continues the report, from the workhouse and from the city soon began to drop in, until on March 31st, 1895, 1251 cases had been treated in hospitals, with 38 deaths, or 11 per cent. Thirteen deaths occurred outside, which would represent about 143 persons attacked, or, in all, 1394 cases. In 1813 Dr. Watt declared that, before the year 1800, 20 out of every 100 children born perished from small-pox. In the epidemic above referred to, it is said, that no vaccinated child under nine years died of the disease, the effects of primary vaccination upon the child population being thus strikingly apparent. In 47 vaccinated cases, where death resulted, 53 per cent had only one scar; 6.3 per cent had two.; but in no single case was it recorded that death resulted in a person vaccinated in accordance with the standard laid by the Local Government Board. During the period of the epidemic about 40,000 persons were revaccinated. Of these 20 were subsequently admitted to hospital suffering from small-pox, but in not one of these cases had revaccination been performed more than fourteen days previously to the onset of the disease, so that it may be said that no successfully revaccinated person contracted small-pox.

HAVRE, FRANCE, February 12, 1896.

## MASSAGE AND ITS ADJUNCTS.

By E. C. ANGELL, M.D.

"The wise, for cure on exercise depend."

—*Dryden.*

ACTIVE and passive exercise is an eminent and potent factor in the establishment and promotion of health.

Massage may be applied by hand, by brushes, or by instruments as muscle beaters, by canon or ten-pin balls, by electricity, by machinery, by position in the use of the inclined plane, or by water.

Among the early appliances of machine massage was a jolting chair, invented by Dr. Halsted, who had a water cure at Round Hill, Mass. It is my impression that this chair originated early in the fifties, and I think it is still manufactured. The first extensive employment of machine massage in the

United States was by Drs. Charles F. and George H. Taylor, who have shown a large amount of inventive genius in this direction, and much skill in the use of machinery of their own invention.

Electricity and water are both already extensively used for this purpose; and I have no doubt that, considering the progressive knowledge of these agents in massage, their use will become much more extensive in the future.

Water is applied in douche, rain, shower, sluice, and spray. It may be hard or soft, fresh or salt, hot, cold, or intermediate. The athlete may bathe in the sun and in the rolling billows, and obtain increased strength from the combined effect of sunshine and vigorous exercise at the same time.

There is another system of massage which, under favorable circumstances and conditions, cannot be surpassed. It is horseback-riding. Lord Palmerston, who acknowledged much indebtedness to this mode of invigoration, is credited with saying, "The outside of a horse is the best medicine for the inside of a man." But there are many invalids for whom this mode of motion is too heroic who may be greatly benefited by the gentle vibrations of a carriage.

If the weather is cold, they should be well wrapped, and the carriage should be open. Many who are greatly in need of fresh air ride in close carriages, and thereby subject themselves to the repeated respiration of the same air, loaded with poisonous emanations from their own bodies. They seem not to know that in confined air their own breath becomes their worst enemy, whether it be in the close carriage or in the close rooms at their homes.

A good example of the advantages of oxygen over respired air was strikingly illustrated a few years since by Dr. Winship, who, under favorable circumstances and conditions, could lift 2500 pounds. He had been talking to a large audience upon physical training when he attempted to lift with one finger a barrel of flour that had been placed upon the stage. He found himself weak and unable to accomplish the undertaking. Sampson was shorn of his strength. He readily apprehended the reason. He had the windows thrown open, and after a few respirations Richard was himself again, and the feat was accomplished.

Here, it may be enunciated, that in massage deep breathing—that is, full inspiration and as complete expiration as possible—is essential to the best results, to the attainment of the best form, the most vigorous health, and the greatest strength. If, therefore, you have a patient who does not ordinarily more than half fill his lungs, and who is consequently not more than half alive, the first lesson should be instruction on deep breathing. In short, you should teach him how to breathe, by full inspirations, through his nostrils, with his mouth shut; which in some instances you will find to be a difficult task.

In considering massage by hand, the question naturally arises, Where should we begin? If there is no cerebral disturbance, the most natural starting point is the head. While the treatment at first should be gentle, it should proceed with increased vigor, that new ideas may be evolved and the activity of the average normal brain may be increased. If there is pain in the head or any other indication of congestion of the brain, the head should not be treated until after the extremities, the muscles, and deep-seated tissues, as well as the surface of the body, have received such attention as will divert the blood from the brain; then careful massage should be applied to the head. This principle holds good in relation to the treatment of congestion wherever situated. Manipulation should not be addressed at once to the congested or inflamed part or organ, as the case may be, which has too much blood already, but rather to the surface, the muscles, and the extremities, that the blood may thereby be diverted, the congestion lessened, and the balance restored.

*Massage of the Eye.*—With regard to particular organs, the eye is a striking example of the possibilities of massage. By massage the rotundity of the ball may be diminished or increased, with corresponding improvement in vision. As long ago as 1848 I first became acquainted with Professor Bronson's method of relieving many short-sighted persons from the unpleasant necessity of wearing glasses by the practice of an ingenious system of massage. Since that time, more or less varied in its application, massage has come into considerable use even by aurists, as well as oculists.

Dr. Morton, in a communication to the *Medical News*, 1894,

advocates the employment of massage in the removal of corneal opacities. It is also advocated in the *Therapeutic Gazette* for December in the same year. Applied early, it has in many instances proved effective in the removal of cataract.

There is probably no example in which the benefits of massage are more speedily shown than in its application to the face and eyes of the champions of the prize ring, in which one or both combatants may have had their jaws punched, their noses bulged, or their eyes closed. In other words, when one or both have been to put to sleep as in a drawn battle. They are indeed sometimes sent to that long sleep from which these chivalric knights, as well as the public, are better off when there is no awakening. But it is none the less surprising with what celerity battered and ugly mugs may be made comparatively presentable by massage and the judicious use of dry, hot air and hot water.

Here it may be added that massage and its adjuncts are the most effective of all treatments for sprained limbs and swollen joints. For treatment more in detail, reference may be had to a paper on inunction and manipulation, which I contributed to THE SANITARIAN in 1878 (Vol. VI., page 481). In the *Medical News* of April 20th, 1895, Dr. Gallant reports the successful treatment of more than twelve hundred cases of sprains. The success of these cases was more significant from the fact that each sufferer was instructed to treat himself twice daily, and meanwhile to make use of the injured limb. This evidence of medical progress in the use of external remedies is encouraging.

Sevenin, of Moscow, has rather recently reported in the *Russian Surgical Annals* twenty-four cases of fractures successfully treated by massage. He predicts a great future for this practice. A copy of the *New England Medical Monthly*, 1894, gives an account of a fracture that was speedily made to unite by hot water and massage, in which other measures had been ineffectually used for four months. For more than twenty years I have made use of massage for the purpose of restoring shrunken muscles, by reason of enforced rest, induced by fractures and dislocations.

Next in the order of treatment is the neck, which the late Dr. Oliver Wendell Holmes describes as follows :

"The stately neck is manhood's manliest part,
It takes the life blood freshest from the heart."

The neck and throat have peculiar tendencies to acute and chronic troubles, and should be treated accordingly.

The free and natural mobility of the head and neck are in many instances impaired by inadequate protection. Too little covering one day and too much the next cause changes that result in stiff neck or *torticollis*. This condition is sometimes more complicated than would generally be supposed. The blood vessels that supply the brain, the muscles, and the nerves become in some degree obstructed, causing adhesions, contractions, and restrictions until impaired circulation robs the brain of its natural nutrition. This leads to mental impairment, to dementia, and in some instances to insanity. In examining, therefore, the supposed insane, the base of the brain and cervical region should be subjected to the most careful and searching scrutiny. When the diagnosis is early and properly made, and the best means of relief are employed, there is reasonable hope of recovery. Active and passive exercises, Faradic and Galvanic electricity, deep and searching massage, and velocity vibrations afford the most certain and the most speedy means of relief.

The hands, arms, and shoulders should next receive attention, nor should the fingers be neglected, as they are often of diagnostic value in discovering the presence of a gouty or rheumatic diathesis. In the event of either of these difficulties, you will find it profitable for the patient to devote considerable attention to these small but important members, that they may be saved from deformity and their usefulness maintained.

In all cases it should be the purpose of the operator to do the patient the greatest good, the highest service in the shortest time. In this way only can he command the respect of those he serves.

There are three important requisites in this, as well as in all other work. The first is intelligence, the second is honesty, and the third is industry. The latter must be backed up by a considerable amount of physical force. To this end those who would achieve the highest success must be temperate in all things.

While massage is especially exacting and laborious, it is of great advantage to many sufferers, and may be a source of great profit to those who have naturally some adaptation, some fitness for the practice. It is hardly to be expected that all will become famous in this vocation. Not every man can be an artist, an orator, or a poet, nor can every man keep a hotel. Nor do all who graduate in medicine become physicians. Neither does every man who receives instruction in massage become an expert manipulator.

It will be generally conceded that no man will be a success in any field of labor, in any artistic or industrial work that he does not like. Any man, therefore, entering this field who finds the work disagreeable or uninteresting, the sooner he abandons it the better for himself and for those who may seek his services. Those who have some natural fitness for this work will find it as easy as others will find it difficult. They will soon discover that one hour each day will often be as profitable as the whole twenty-four hours in many other pursuits.

These advantages justify close attention, and all who would achieve the highest success should avail themselves of the best literature upon this subject. Dr. Douglas Graham is a good example of what may be done in this undertaking. He learned massage of a man who had acquired a reputation at the "Hub" for skill in this work. His success afforded him the means to study medicine. In due course he became a physician, and for many years in the practice of massage he has had to a large extent the co-operation of the medical profession of Boston. He has written extensively upon this subject, and his writings may be read with profit. Others with like ambition, intelligence and industry may be equally successful, and by skilled labor and study may become accomplished and renowned physicians. The highest success in massage is only possible for those who are well informed in anatomy, physiology, and general hygiene. Special knowledge should be acquired in the medical uses of electricity. This agent skilfully applied is in many instances of signal service. For paralysis especially it affords the best treatment. The benefits of machine massage and velocity vibrations were well illustrated in a railroad excursion kindly tendered a party of

medical editors and others, of whom the writer was one, by the Sea Board Air Line Railroad to some Southern sanitary situations a short time ago. A train of private cars, including a kitchen and dining car, was placed at our disposal. This enabled us to travel with little interruption, as our hotel travelled with us. We were, nevertheless, most hospitably banqueted at many attractive hotels that were permanently situated. The distance traversed was twenty-five hundred miles. Several ladies were of the party, and their improved appearance was specially striking. The massage and vibrations acted as a gentle lullaby, promoted sleep, and gave new energy and tone to every function, and imparted to all improved health, strength, and vigor. At the conclusion of the journey, in appearance as well as in fact, they were as much above the average in vital force as some of them seemed to be below at the start. Doubtless the excursion itself is an important element in the benefit derived from the change of climate from New England to Florida, to Mexico, or to the Pacific States, provided always that the cars are ventilated.

I have observed results quite as tangible in the advantages derived from four-in-hand coaching and railroading in the Scotch Trosachs, the forests of Fontainebleau, the regions of the Black Forest, the Apennines, and the Alpine mountains of Germany and Switzerland. Nor can we forget the attractions and invigorating effects derived from coaching and railroadings in our own mountains. Those who are so fortunate as to make these excursions can exclaim, like Byron :

> " Oh, there is sweetness in the mountain air
> And life, which bloated ease may vainly hope to share !"

It was not until our American engineers had made railroading a success to the top of Mount Washington that the Swiss sent the iron horse to the top of the Rigi, and the Italians by the same means ascended Vesuvius. It is said the Jung Frau and Mount Blanc are soon to be climbed by the same system.

After treating the hands, the arms and shoulders should next receive attention, and then the chest. Both shoulders and chest are often the seat of gout, neuralgia, or rheumatism. For the relief of these difficulties the honest, intelligent worker in hand massage has often accomplished more than has been achieved by all other remedies. Evidence of this may be

found in the writings of many of the most eminent physicians in this and other countries who have given this subject careful consideration.

Among the important adjuncts of massage are *fasting* and *sunshine.* They are both old and new. The first was practised by Moses, and from him has descended to the Church, where it remains a matter of religious restriction. Its advantages are such that there is little doubt but that its benefits in the near future will receive much wider recognition. Neglect of the benefits of fasting not only greatly shortens life, but largely adds to its discomforts, and magnifies the work of the physician. Many, perhaps most, of our business men breakfast too hurriedly. They then ride to business in an atmosphere generally vitiated. In the midst of business they mechanically rush to the lunch counter under the sign "Quick Lunch." On retiring to their homes, exhausted with the work of the day, they partake of a "square" dinner. Neither breakfast nor lunch is more than half digested before the third call is made upon the outraged digestive organs, which are always loaded more than one day in advance of their ability to digest. Such overwrought business men always have unsatisfied appetites, because what they swallow is not digested and appropriated. It would be a revelation to any one of such persons who would fast one day every week, and drink nothing but pure water. It would be a *put* on a new lease of life. But without help they will continue to eat despite their inability to digest. *They* live to eat, instead of eating to live. With them digestion never awaits appetite.

In these cases of impaired digestion from eating too fast, too often, too many kinds of food, and too much, the skin becomes clogged, and there is general congestion and want of oxidation. The nervous system is thrown out of balance, and the mental state is abnormal. The sufferer sleeps when he should be awake, and is awake when he should be asleep. This is a condition which induces disease that will take the form to which the sufferer is predisposed. It may be gout, neuralgia, rheumatism, tuberculosis, or mental aberration.

To avert such results the transgressor should fast at prescribed periods. He should bathe in dry heat, at high temperatures, or be exposed to the solar rays. He should have

massage. These are the cases in which an ounce of prevention well and timely applied is often worth a ton of cure. It will in many instances save life when the cure would ignominiously fail. If, like Mr. Gladstone, they would habitually wield the axe, the beetle, or the bucksaw, or work in the field or meadow, they might help themselves. This is physical exercise the benefit of which they so much need.

The business man is not the only sufferer from too much food and too little physical exercise. The man of abundant leisure and of abundant means frequently eats to kill time. He lives at a hotel on the American system, and takes four meals a day until he finds by his jaded appetite that he has not the stomach of an ostrich. Massage is his best resort, but his case is too often hopeless. Such persons should heed the counsel of Socrates, to beware of such food as tempts a man to eat though he be not hungry. "Few die of hunger; of surfeit hundreds of thousands."

Much as intemperance in the use of beverages shortens life, there are more untimely deaths from intemperate eating. Death certificates and obituary notices give the cause any other than its right name. These names are in some sort made to conform to the dictates of fashion. They die of "gastric derangement" or "hereditary inebriety." This is fashion to the death. Here something is due to the genius of the physician in satisfying friends and relatives.

All who treat disease should know something of dry, hot air and its place and importance among natural remedies The sun is the great source of life, light, and heat, and in the work of massage the patient should be kept as much as possible in the sun. By this means the advantages and benefits of massage will be more than doubled. By exposure to the sun they will be enhanced more than tenfold, and in many instances more than a hundredfold.

A hospital or sanitarium without a solarium is like the play of "Hamlet" without the Prince of Denmark. All inmates of these institutions should receive the invigorating benefits of the solar rays.

> "Blest power of sunshine, genial day,
> What balm, what life are in thy ray."

For nearly twenty years the solarium at the Lexington

Avenue Sanitarium, while under my direction, was used often without charge with great benefit to many invalids. Since the discontinuance of that establishment I know of no place where effective solarization can be obtained in the city of New York. One of the disciples of Hygeia trained in that institution took with him to Montauk Point, in 1894, a class of eager students, where they bathed, sported, and rolled in the sand, exposed to the sun, and sometimes taking as many as ten surf baths a day. In the space of three weeks they were done brown, and acquired a degree of health, strength, and vigor which, like a surcharged storage battery, greatly added to their ability to withstand the rigors and changes of an unusually severe winter.

The general application of dry, hot air is next in importance to exposure to the sun, which in this region, with our present knowledge, is only available a part of each day and a part of each season. It is claimed, however, that solar heat and solar light can, by electricity, be produced at will. "'Tis a consummation devoutly to be wished." Until the machinery for this result is further perfected, we will have to depend upon dry, hot air, which in our larger cities is more or less effectively produced at all hours of day or night at all seasons.

All who would treat disease should bathe in the sun and in dry, hot air until they understand the advantages of both, that they may know the best means of keeping themselves in the best working condition, and that they may know when and for what reason these agents should be recommended to the patients they treat. In fact, there is no place where massage in all its forms can be so effectively administered and can be so fully learned as in a well-appointed, well-constructed, and well-conducted bathing establishment, where Turkish, electric, Roman, and solar baths are administered on strictly scientific methods. Such an establishment was never more needed in the city of New York than at this time.

These educational advantages cannot be obtained in the average bathing establishment, as their attendants are generally beggars, beer drinkers, and blockheads. Dry, hot air, at high temperatures, conjoined with complete and constant ventilation and skilled manipulation, timely applied, would save many valuable lives that are annually sacrificed to "scientific" stupidity. Take, for instance, a man clogged, congested, and

obstructed in a struggle for life. Every avenue of escape should be offered him. In such cases what is the first step taken by the average physician? Already heavily laden with disease, he is further loaded with drugs. This is little better than adding insult to injury, and often taxes the powers of the patient to the uttermost. If he recovers, it is not by reason of medication, but in spite of it. Nature has been equal to the combined assault of disease and drugs. Give him air, give him baths, give him electricity, give him massage, and withhold food, and you may give him back his health and his natural vigor. Massage of itself is largely confined to the treatment of chronic conditions. Associated with dry, hot air, in many cases it fairly divides the honors in preventing as well as removing acute and chronic maladies.

Now and then some one outside a sanitarium and sometimes a physician blunders upon some simple method of saving his patients. Could he accomplish as much by drugs he would be a hero, an oracle, a sage, if not a saint.

An example of this character comes from the South, and from its rarity is especially noteworthy. Dr. Metcalf, of Natchez, has discovered (*Medical Record* of April 7th, 1894) that massage applied in the early stages of pneumonia will in some instances effect a cure in two applications of ten minutes each. On January 26th, 1896 (New York *Medical Journal*), he gave a still further account of the effectiveness of massage in the early treatment of this disease.

This calls to mind a case of pneumonia brought to my establishment about fifteen years ago by a prominent New York City physician. He said: "This man has pneumonia; please give him a Turkish bath and have him wrapped in blankets until I return." Some three hours later the doctor returned, examined the patient, and found him so much improved that he sent him again to the chambers for another Turkish bath. I had heard nothing further from this case until ten years later, when a man of apparent health and vigor accosted me as I was sitting one summer evening in front of my office. He said: "I suppose you have forgotten me. I am the man who was brought here by Dr. ——— ten years ago with pneumonia. I was pretty far gone then, but your baths saved me, and I have been all right ever since."

At some seasons of the year we were giving over a hundred baths a day, and cures like this, though often effected, were rarely reported. Knowledge of the result of this was due to the accident of my being outside as this man was passing my establishment. In the twenty years of my work in practical sanitation many cases of acute congestion of the lungs at least, if not pneumonia in its early stages, have been promptly relieved by hot-air, electric, and Roman baths.

Here I am reminded of an incident connected with a young physician of more than average candor and intelligence. For a considerable period he held the position of police surgeon, which afforded a considerable salary. He was not only a frequent visitor, but sent me many of his patients.

By reason of political revolution he was thrown out of office, when he was frank enough to declare as follows :

" When patients have come to me with asthma, bronchitis, colds, dyspepsia, gout, grip, pleurisy, pneumonia, malaria, neuralgia, rheumatism, or the early stage of bright's disease or tuberculosis, I have sent them to you, and in most instances in a few days they were ready to return to business. Now the situation is changed. It takes me six weeks to cure one of these cases, and I cannot now forego the advantages of treating them myself. Nor can I visit you as often as heretofore."

The liver is a part of the digestive system that will often claim your attention. By skilled massage you can do more to improve this organ and increase its activity and usefulness when it becomes sluggish than all the blue mass that has ever existed.

After the digestive organs we come to the legs, which may suffer from cramps, pain in the great sciatic—the largest nerve in the body—or there may be gout, neuralgia, rheumatism, or the lameness and stiffness incident to old age, malaria, mechanical injuries, or overwork. There may be varicose veins. To check the tendency of these veins to indurations and ulcerations, stockingette bandages should be skilfully applied and steadily worn through the day and removed at night. The removal of these bandages should be followed by sponge baths and massage, and upon retiring the feet should be elevated higher than the head.

In the treatment of the extremities the work should be thorough and toward the trunk. The boy who was called before the school for some misdemeanor and asked how he would be flogged, promptly answered: "After the Chinese method of penmanship—the heavy strokes up and the light ones down." This is the correct method for the treatment of the fingers and hands, the toes and feet, the arms and legs.

The feet upon which we move, stand, and have our being are of too much importance to be lightly considered. They are so generally distorted by the shoemaker and the eating and drinking habits of their owners, that it is hard to find a natural foot. Trilbies of either sex are rare, and so are "little Billies."

The importance of proper treatment of the feet in massage, in controlling the circulation, cannot well be overestimated. There are many sufferers from cold feet, and in some of the States—Indiana, for instance—they are said to be a sufficient cause for divorce. It is by no means a small matter to suffer habitually from cold feet, especially in the winter months, for at this season cold feet and insomnia are generally inseparable. As a rule, one of the first inquiries made by the massage operator should be in relation to this by no means uncommon disability. By attention to the feet much of existing cerebral disturbance can for the time being be removed. There are, therefore, many cases in which massage should begin with the feet and end with the feet, which at the finish should retain a glowing warmth. Here it may be remarked that in no part of the body is the massage operator more likely to fail than in thoroughness as applied to the feet. Failure here may completely frustrate his usefulness in this vocation.

The best outer covering for the feet is unquestionably the best-constructed, best-fitted, best-fashioned up-to-date felt shoe. Felt, being porous, permits the heat to escape, prevents corns, and maintains complete dryness and warmth, and thereby promotes health.

I now come to a description of the complete Roman bath, which I was the first to successfully establish in this country in 1874, after it had slumbered two thousand years. It commenced with preliminary anointing in oil, of moderate cost, and after a sojourn in the hot chambers of the baths of the

Eternal City, ended in the inunction of the whole body, for her wealthy residents, in perfumed oils of great value, which were brought with them by their attendants in golden vessels.

In this concluding process of the bath, or of massage, the patient should preferably lie in the sun—in any case, in a room well warmed. His back should rest upon a narrow, well-upholstered couch, of suitable height, length, and strength. If the patient is neither lame nor weak, he should be asked to raise his right hand. The operator should support the hand while he treats the fingers, working all the while toward the hand, first with long stroking motions, following the general course of the muscles, and next with rotary motions at right angles with the muscles. He should next treat the hand, finishing fingers and hands with percussion until both are thoroughly warmed. He should next treat the arm, using both hands and working toward the shoulder. This procedure should be applied to the left hand and arm. The neck, shoulders, and chest should next be treated. Both hands should be employed, and they should be carried well around the neck and shoulders and well around the body the entire length of the trunk. The long stroking motions should be followed by vibration and percussion.

There are some cases where there is insomnia or nervous irritability, in which a soothing or sedative effect is desired, when vibration should be gentle and percussion should be omitted.

The abdominal region comes next, and the treatment should consist of kneading, vibration, and percussion. Unless contra-indicated, the same measures should be applied to the liver, a section of which may be reached just below the ribs on the right side. If there is indigestion or habitual constipation, kneading, vibration, and percussion should be applied over the general course of the colon. There is no other means equally efficient in combating this tendency, as well as the opposite condition of diarrhœa. As both proceed from the same cause—indigestion and faulty nutrition—it is not surprising that both can be readily relieved by the same means.

The toes, feet, and legs should be treated substantially as the fingers, hands, and arms. It will be easier to treat the

lower extremities if they are considerably elevated. This will enable the operator to work downhill. The elevation of the feet and legs is especially essential in œdema or where there are varicose veins. As a rule, the feet should receive a generous amount of friction. They should not only be thoroughly warmed, they should be kept warm. If the room or the weather is cool or cold, they should be carefully wrapped in blankets or covered with warm stockings.

The patient should now face the couch. The operator should stand upon the right side. He should move his hands alternately firmly and rapidly right and left well around the body, from the neck to the base of the trunk. He should next move to the opposite side and treat the other side of the patient.

He should next stand at the head of the patient, his thumbs resting upon the spine, the hands clasping both sides of the back, when they should be firmly and rapidly moved the entire length of the trunk.

He should next place his left hand upon the spine at the base of the brain, over this the other hand should be placed to give increased pressure, when both should be moved firmly and rapidly the entire lengh of the spinal column.

If the patient desires massage of the head, it will furnish the conclusion of the process. Massage of the head and scalp prevents the hair from falling and promotes its growth.

The manipulations, therefore, consist mainly in light or heavy, deep or surface, long stroking motions, with friction, with rotary or twisting motions, with vibration and percussion.

Oil is used plentifully to prevent abrasion of the surface, and often as a means of enhancing nutrition and increasing warmth and weight. When reduction of weight is desired, an unguent should be used of which little is absorbed.

The operator for this work must not spare himself in rapidity, strength, or vigor, always considering the strength and vigor of the patient. If this luxury of the Cæsars is to be administered in a well-appointed, well-conducted bathing establishment or sanitarium, there should be a skilled operator on each side of the patient. In this way many advantages can be secured, as nearly double the amount of work can be accomplished at the same time.

This labor applied with skill and vigor is no less grateful than salutary. A Turkish bath consists largely of massage, while a Roman bath, as known in the city of New York, is all massage. A Turkish and Roman bath conjoined, therefore, afford the most speedy means of dispelling colds, and they will often dissipate a recent rheumatism, a sciatic attack, and in most instances the sufferer will depart without his lumbago on his first visit. High temperatures and effective ventilation are indispensable in the attainment of such results.

Under the vigorous friction of the Roman bath, the back becomes as red as a boiled lobster, and the blood finds its way into the myriads of fine capillaries, and the glowing warmth and a new vigor pervade every extremity of the entire man. This leaves little opportunity for cold feet, as warm blood has been vigorously pumped into them.

It is not uncommon to hear those who have received these baths in their best form exclaim in exuberance of spirits: "I feel like a champion prize fighter! I would like to give somebody a thrashing! I could fight a grizzly bear or annihilate a tiger!"

It is no child's play to give such rubbings, and the "grand Turk" who came with me from Constantinople in 1872, weighing 150 pounds, and left me to return in 1880, weighing 200 pounds, earned for himself in this rôle the well-deserved title, "The King of Rubbers." Long live the King!

It was his skill and vigor in massage and in Turkish, electric, and Roman baths that enabled him, with much study, to earn his degree of M.D. in the medical department of the University of the City of New York.

Such frictions as he administered, such rubbings as he gave, without lubrication would have been impossible. Without oil electric sparks would have been evolved, and the back would have been literally set on fire. It was at the conclusion of the first Roman bath taken by Dr. William R. Alger, that he exclaimed, "This is superb; it is the very quintessence of luxury!"

Courtlandt Palmer, the founder of the Nineteenth Century Club, after receiving his first Roman bath addressed me as follows: "You have accomplished what I supposed impossible. You have made bathing both effective and luxurious."

Observing the grand Turk as he moved about after giving him his baths, he exclaimed, "That is the handsomest man I ever saw." His admiration was well bestowed. The Apollo Belvedere or Hercules himself was not his superior. He was an artistic model that would have immortalized himself and sculptor.

The restoration of the complete Roman bath marked a new era, and gave a new impetus to massage, which had long ineffectively struggled for wider recognition. Since that period its advantages and benefits have greatly and steadily extended. The Roman bath at its best is the perfection of massage, and can be administered in the sick-room and at the bedside of the patient who is too ill for removal, and is applicable and available in as many acute as chronic conditions. Eczema, psoriasis, and urticaria are speedily dissipated by this means. In these conditions inunction should be the first step. The skin will generally be found dry and thirsty for oil, which it will absorb like a sponge. Five ounces, in many cases, will disappear in a preliminary inunction, and if the hot chambers follow, as much more will be readily appropriated to satisfy this hunger for nutrition.

Inunction and massage are among the most efficient aids in reducing high temperatures from whatsoever cause. Insomnia yields to these agents, which combine advantages that have not been approached by any other means. There are many intractable and stubborn conditions, where Faradic, Galvanic, and static electricity may in addition be brought to the rescue.

These aids are alike grateful to the athlete and a help in physical training. They can be tempered to the strongest as well as the weakest. They can be used to increase or diminish weight. The character of the inunction and the manner of massage should in all cases be determined by the mental, moral, and physical condition of the patient.

The experience I have had in the treatment of *hernia* has demonstrated that a large share of these cases can be radically relieved and permanently emancipated from the tortures of the truss by well-placed position and skilled manual and machine massage.

It is equally certain that many of the discomforts and dis-

eases of women may be effectually eradicated by the same means and the sufferers restored to full vigor in every function. Maternity is the highest attribute of the complete, the perfect woman, the supreme handiwork of nature, described most felicitously by Milton as "God's last best gift."

Massage by machinery affords many advantages that cannot be attained by hand. It is given over the clothing, and inunction is out of the question. There are many cases and conditions in which inunction is too important a requisite to be ignored. Although the practice was largely used by the Greeks, as well as the Romans, its advantages and possibilities are even now only indifferently understood.

For the purpose of inunction, I have rather recently introduced a comparatively new element. It is oil charged with ozone. By using oil from the needles of the pine and spruce, charged with ozone, we have a product which is at once balsamic and ozonic. It is possible by this means to surcharge the system with this detergent, this disinfectant, to an extent that has hitherto been impossible by any means at our command.

The introduction of this agent is so recent that at this time it is impossible to predict the advantages that are in store for ozonized inunction.

Massage, like many other good things, may be abused. Ignorant and noisy pretenders abound in all occupations, and we have massage operators who are good, bad, and indifferent. The patient who falls into the hands of one of these haphazard ignorant pretenders, and is thereby tortured, deserves to be commiserated. Many sufferers have no means of knowing except upon trial, and hardly then, whether they are ill or well served.

Their danger or safety rests largely with their physician, who should be careful to recommend only those who have acquired the true *tactus eruditus*, the learned touch.

The significance of natural remedies were well and wisely enunciated by the late Dr. Oliver Wendell Holmes:

> "Of all the ills which suffering man endures,
> The largest fraction liberal nature cures,
> Wins back more sufferers with her voice and smile
> Than all the trumpery of the druggist's pile."

# FOODS: NUTRITIVE VALUE AND COST.*

By W. O. ATWATER, Ph.D., Professor of Chemistry in Wesleyan University.

## THE DIGESTIBILITY OF FOOD.

"WE live not upon what we eat, but upon what we digest." In other words, the value of food for nutriment depends not only on how much of nutrients it contains, but also upon how much of these the body digests and uses for its support.

By digestibility of food several different things are, or may be, meant. Some of these, as the case with which a given food material is digested, the time required for the process, the influence of different substances and conditions on digestion, and the effects upon health and comfort are so dependent upon the peculiarities of different individuals, and are so difficult of measurement, as to make the laying down of hard-and-fast rules impossible. For our present purpose, the most important factor is the amount digested. This, fortunately, is more easy to determine. Understanding by the digestibility of a food the proportions of each of the nutrients which can be actually digested by healthy persons, the question can be answered more or less accurately by experiment.

Briefly expressed, the method consists in weighing and analyzing both the food consumed and the solid excrement. Since the latter represents the amount of food undigested and unassimilated, the difference is taken as the amount digested. A large number of such tests of the digestion of feeding stuffs by domestic animals have been made in European, and of late in American experiment stations. The number of experiments upon the digestibility of food of man is small. Scarcely more than a hundred reliable series have been reported. The very large majority of them have been made in Germany, most of them with healthy men.

The results may be briefly summarized as follows:

1. The protein of our ordinary meats, fish, and milk is very readily and completely digested. The protein of vegetable foods is much less completely digested than that of animal

* Concluded from page 210, preceding number.

foods. Of that of potatoes, whole wheat, and rye flour one fourth or even one third may escape digestion, and thus be useless for nourishment. Roughly speaking, one sixth or one seventh of the protein of wheat flour, corn meal, beans, and peas may be assumed to be undigested when cooked and eaten in the usual way.

2. Much of the fats of animal food may at times fail of digestion. This is presumably true of vegetable fats, but the quantities are in general so small that the determinations of the proportions digested are not very accurate. The experiments thus far made imply that perhaps 5 per cent of the fat of meats, eggs, milk, butter, oleomargarine, and lard will escape digestion as they are ordinarily eaten.

3. The carbohydrates, which make up a large part of vegetable food, are in general very completely digestible. The crude fibre, or cellulose, is an exception, but the quantities of this in the materials used for the food of man are too small to be of importance. Sugar is believed to be completely digested. This is assumed to be the case with the sugar of milk. The other carbohydrates of animal foods are very small in amount.

4. The animal foods have in general the advantage of the vegetable foods in digestibility in that they contain more protein and that their protein is more digestible.

5. The quantity digested appears to be less affected by flavor, flavoring materials, and food adjuncts, and to differ less with different persons than is commonly supposed.

One important thing to remember is that the food we digest is not always utilized to the best advantage. Different people differ greatly in this respect. One man may be able to do a large amount of work and another very little when both have the same diet and digest the same amounts of nutrients from it. One person will grow fat upon an amount of digested material with which another will not gain in weight at all. The getting of the most good from food is not so much a matter of digestion as of making use of what is digested.

### THE FITTING OF FOOD TO THE NEEDS OF THE BODY.

In the adjusting of diet to the demands of the body, the important matter is to provide enough protein for the build-

ing and repair of tissue and enough energy to keep it warm and do its work. Considering the body as a machine, there must be material to make it and keep it in repair and fuel to supply heat and power. If there is not food enough or the nutrients are not in the right proportions, the body will be weak in its structure and inefficient in its work. So, likewise, if there is too much, damage to health will result.

While this is true as a general principle, and while this principle is the fundamental one in food economy, there are many modifications in detail, not as many as there are different persons and different kinds of food to be fitted to their peculiarities of digestion and assimilation, but still very many.

Thus, people in poor health or with weak digestion or with certain peculiarities of the nutritive system, are often obliged to be very particular in the selection of their food. A man who can ordinarily "eat anything" may be forced, in illness, to live on gruel or beef tea. The numerous food preparations for people with weak digestion are made in response to an actual and pressing need of partially digested, or at least of easily digestible, nutriment. Of the meat extracts in the market some contain very little and others practically no material which builds tissue or yields energy. In other words, they have little real nutriment and sometimes almost none. They are as much medicine as food, but often their value is inestimable.

There are people who, because of some peculiarity of the alimentary system, are debarred from using foods which for people in general are most wholesome and nutritious. Some persons cannot endure eggs, others suffer if they take milk, others have to avoid certain kinds of meat, and others suffer nausea or severe pain if they eat fruits which are generally agreeable to the taste and healthful in their effect. But these are exceptions.

In such matters we are apt to be impressed by the exception rather than the rule. It is nevertheless true for a great majority of people—for nearly every one who is in good health and uses the ordinary standard, wholesome foods—that a healthful diet is that which supplies the quantities of nutrients which the body requires.

Of course there is a great difference in the requirements of

different people. The kinds and amounts of food best fitted for nourishment vary not only with sex, age, size, occupation, and climate, but also with the peculiarities of the individual. But it is possible in a general way to estimate the amounts of actual nutrients needed on the average by people of different classes and occupations.

## DIETARIES AND DIETARY STANDARDS.

As the outcome of a great deal of observation and experiment, nearly all in Europe, standards have been proposed for the amounts of nutrients and energy in the daily food required by different classes of people. Those of Professor Voit, of Munich, Germany, are most commonly accepted by specialists in Europe. Voit's standard for a laboring man at moderately hard muscular work calls for about 0.25 pound of protein and quantities of carbohydrates and fats sufficient, with the protein, to yield 3050 calories of energy. Taking into account the more active life in the United States, and the fact that well-nourished people of the working classes here eat more and do more work than in Europe, and in the belief that ample nourishment is necessary for doing the most and the best work, I have ventured to suggest a standard with 0.28 pound of protein and 3500 calories of energy for the man at moderate muscular work.

Just what compounds in food are needed for the nutriment of the brain physiological chemistry has yet to tell us, but it is certain that people with little muscular exercise require less food than those who labor. Well-to-do professional men and students in Europe with less muscular exercise than mechanics have been found to be well nourished with an average of 0.23 pound of protein and 2700 calories of energy. In the cases observed in the United States the amounts eaten by professional men have been much larger.

The figures of Table 1, which are taken from a large number reported by different investigators, will serve to show how the actual dietaries of people of different classes at home and abroad compare with the standard dietaries which have been proposed as the result of observations and experiments. The figures for European dietaries are mostly by Voit and his followers in Germany, and by Playfair in England; the Ameri-

TABLE 1.—*American and European dietaries and dietary standards.*

[Quantities per man per day.]

| Dietaries. | Nutrients. | | | Fuel value. | Nutritive ratio.* |
|---|---|---|---|---|---|
| | Protein. | Fats. | Carbohydrates. | | |
| *American (Massachusetts and Connecticut).* | | | | | |
| | *Lbs.* | *Lbs.* | *Lbs.* | *Cal.* | |
| Family of carpenter in Middletown, Conn | .25 | .28 | .76 | 3,055 | 5 5 |
| Family of glass-blowers in East Cambridge, Mass | 0.23 | 0.29 | 1.06 | 3,590 | 8.2 |
| Boarding house, Lowell, Mass.; boarders, operatives in cotton mills | .29 | .44 | 1.21 | 4,650 | 7.6 |
| Boarding house, Middletown, Conn.; well paid machinists, etc., at moderate work: Food purchased | .28 | .41 | .94 | 4,010 | 8.8 |
| Food eaten | .23 | .34 | .84 | 3,490 | 7.3 |
| Blacksmiths, Lowell, at hard work | .44 | .67 | 1.75 | 6,905 | 7.4 |
| Brickmakers, Massachusetts; 237 persons at very severe work | .40 | .51 | 2.54 | 8,850 | 11 |
| Mechanics, etc., in Massachusetts and Connecticut; average of 4 dietaries of mechanics at severe work | .48 | .65 | 1.65 | 6,705 | 6.6 |
| Average of 20 dietaries of wage-workers in Massachusetts and Connecticut | .34 | .50 | 1.38 | 5,275 | 7.5 |
| Average of 5 dietaries of professional men and college students in Middletown, Conn.: Food purchased | .30 | .36 | 1.13 | 4,140 | 6.6 |
| Food eaten | .27 | .34 | 1.06 | 3,925 | 6.6 |
| *European (English, German, Danish, and Swedish).* | | | | | |
| Well-fed tailors, England, Playfair | .29 | .09 | 1.16 | 3,055 | 4.7 |
| Hard-worked weavers, England, Playfair | .34 | .09 | 1.37 | 3,570 | 4.8 |
| Blacksmiths at active labor, England, Playfair | .39 | .16 | 1.47 | 4,115 | 4.7 |
| Mechanic, Munich, 60 years old, in comfortable circumstances, light work, Forster | .26 | .15 | .76 | 2,325 | 4.3 |
| Well-paid mechanics, Munich, Voit | .34 | .12 | 1.06 | 3,085 | 4 |
| Carpenters, coopers, locksmiths, Bavaria; average of 11 dietaries, Voit | .27 | .08 | 1.28 | 3,150 | 5.3 |
| Miners at severe work, Prussia, Steinheil | .30 | .25 | 1.40 | 4,195 | 6.7 |
| Brickmakers (Italians), Munich, diet mainly maize meal and cheese, severe work, Ranke | .37 | .26 | 1.49 | 4,540 | 5.6 |
| German army ration, peace footing | .25 | .09 | 1.06 | 2,800 | 5 |
| German army ordinary ration, war footing | .30 | .13 | 1.08 | 3,095 | 4.6 |
| German army extraordinary ration, in war | .42 | .10 | 1.49 | 3,985 | 4.1 |
| University professor, Munich; very little exercise, Ranke | .22 | .22 | .53 | 2,325 | 4.7 |
| Lawyer, Munich, Forster | .18 | .28 | .49 | 2,400 | 6.3 |
| Physician, Munich, Forster | .28 | .20 | .80 | 2,830 | 4.4 |
| Physician, Copenhagen, Jurgensen | .30 | .31 | .53 | 2,835 | 4.1 |
| Average of 7 dietaries of professional men and students, Germany, Denmark, and Sweden | .25 | .22 | .63 | 2,670 | 4.7 |
| *Dietary standards.* | | | | | |
| Adult in full health, Playfair | .26 | .11 | 1.17 | 3,140 | 5.5 |
| Active laborers, Playfair | .34 | .16 | 1.25 | 3,630 | 4.7 |
| Man at moderate work, Moleschott | .29 | .09 | 1.21 | 3,160 | 4.9 |
| Man at moderate work, Voit | .26 | .12 | 1.10 | 3,065 | 5.3 |
| Man at hard work, Voit | .32 | .22 | .99 | 3,370 | 4.7 |
| Man with little physical exercise, Atwater | .20 | .20 | .66 | 2,450 | 5.5 |
| Man with light muscular work, Atwater | .22 | .22 | .77 | 2,800 | 5.7 |
| Man with moderate muscular work, Atwater | .28 | .28 | .99 | 3,520 | 5.3 |
| Man with active muscular work, Atwater | .33 | .33 | 1.10 | 4,060 | 5 6 |
| Man with hard muscular work, Atwater | .39 | .55 | 1.43 | 5,700 | 6.9 |

* The nutritive ratio is the ratio of the protein to the sum of all the other nutritive ingredients. The fuel value of the fat is two and a quarter times that of the protein and carbohydrates. In calculating the nutritive ratio the quantity of fats is multiplied by two and one-fourth. This product is added to the weight of the carbohydrates. The sum divided by the weight of the protein gives the nutritive ratio. Materials with large amounts of fats or carbohydrates and little protein, like fat meats or potatoes, have a "wide" nutritive ratio. Those with a large amount of protein as compared with the carbohydrates and fats, like lean meat, codfish, and beans, have a "narrow" nutritive ratio. In other words, the materials rich in tissue-forming substances have a narrow, and those with a large preponderance of fuel materials have a wide, nutritive ratio. This is an important matter in the adjusting of food to the demands of the body.

A well balanced diet is one which has the right ratio of protein to the fats and carbohydrates. A relative excess of the tissue formers makes the ratio narrow, while an excess of the fuel ingredients makes an overwide ratio in the diet. Either of these errors is disadvantageous. Our food materials and our diet are apt to have too wide a nutritive ratio. In other words, we consume on the whole relatively too little protein and too much of the carbohydrates and fats.

can figures are by the writer and his associates; all are based upon the observations of actual dietaries.

The dietary standards of the same table are intended to represent the average needs as nearly as they can be estimated from the data now at hand. Much more inquiry will be necessary to make them as reliable as is to be desired.

## PECUNIARY ECONOMY OF FOOD.

The cost of food is the principal item of the living expenses of most people.

The large majority of families in this country are said to have not over $500 a year to live upon. On the average more than half of this goes, and must go, for food. The cost of preparing food for the table, rent, clothing, and all other expenses must be provided from the remainder.

In parts of the West and South where food is very cheap its cost in proportion to other expenses is less, and sometimes falls a little below half the income.

These statements apply less accurately to farmers than to the inhabitants of the larger towns, but, although the farmer produces much of his food, yet, taking everything into account, the expense for nutriment is large even for him.

Although the cost of food makes so large a part of the whole cost of living, and although the health and strength of all are so intimately connected with and dependent upon their diet, yet even the most intelligent people know less of the actual uses and values of their food for fulfilling its purposes than of almost any other of the necessities of life.

## CHEAP *vs.* DEAR FOOD.

The cheapest food is that which supplies the most nutriment for the least money. The most economical food is that which is the cheapest and at the same time best adapted to the wants of the eater. The maxim that "the best is the cheapest" does not apply to food. The best food in the sense of that which is the finest in appearance and flavor and which is sold at the highest price is not generally the cheapest, nor is it always the most healthful or economical. Yet very many

people seem to think that they must have this sort of food, and that to economize by using anything inferior in quality or cheaper in price would be a sacrifice of both dignity and principle.

Mr. Lee Meriwether, who has given much attention to this special subject, cites a case in point, that of a coal laborer who boasted: "No one can say that I do not give my family the best of flour, the finest of sugar, the very best quality of meat." He paid $156 a year for the nicest cuts of meat, which his wife had to cook before six in the morning or after half-past six at night, because she worked all day in a factory. When excellent butter was selling at 25 cents a pound he paid 29 cents for an extra quality. He spent only $108 a year for clothing for his family of nine, and only $72 a year for rent in a close tenement house, where they slept in rooms without windows or closets. He indulged in this extravagance in food when much less expensive food materials, such as regularly come upon the tables of men of wealth, would have been just as nutritious, just as wholesome, and in every way just as good, save in its gratification to pride and palate. He was committing an immense economic blunder. Like thousands of others, he did so without understanding at all that it was a blunder.

Just here is one great difficulty: the lack of information regarding the nutritive values of foods. Even those who wish and try to economize in their purchase and use of food do not understand how. They carefully consult the prices, but have in general very vague ideas about values for nourishment as compared with cost. Persons who are exceedingly economical in purchase of clothing and in other expenditures do not, and in many instances cannot, practice intelligently the same economy at the markets. Frequently people pay from $1 to $2 a pound for the protein of the meat and other animal foods they use, when it might be obtained in forms equally wholesome and nutritious for 15 to 50 cents per pound. The food thus purchased is apt to supply some of the nutrients in excessive amounts as well as at needlessly high costs, while it furnishes others in insufficient quantities or in unfitting forms and in uneconomical ways, and only too often a large part of it finds its way into the drain or the garbage barrel instead of being

utilized for nourishment. The difficulty is that in comparing different food materials with respect to their cheapness or dearness we are apt to judge them by the prices per pound, quart, or bushel, without much regard to the amounts or kinds of actual nutrients which they contain.

Of the different food materials which the market affords, and which are palatable, nutritious, and otherwise fit for nourishment, what ones are peculiarly the most economical? There are various ways of comparing food materials with respect to the relative cheapness or dearness of their nutritive ingredients. One, and perhaps the best, consists in comparing the nutrients obtained for a given sum in different materials. Estimates of the amounts of nutrients that could be purchased for 25 cents at the rates named are given in Table B, and graphically shown in Chart 2. The calculations are based upon the analyses in Table A (preceding number).

The figures of Table B tell their story so plainly that they need very little comment. A quarter of a dollar invested in the sirloin of beef at 22 cents per pound pays for one and one seventh pounds of the meat with three eighths of a pound of actually nutritive material. This would contain one sixth of a pound of protein and one fifth of a pound of fat, and supply 1120 calories of energy. The same amount of money paid for oysters at the rate of 50 cents per quart brings two ounces of actual nutrients, an ounce of protein, and 230 calories of energy. But in buying wheat flour at $7 a barrel, the 25 cents pay for six and a quarter pounds of nutrients, with eight tenths of a pound of protein and 11,755 calories of energy.

The price of food is not regulated solely by its value for nutriment. Its agreeableness to the palate or to the buyer's fancy makes a large factor of the current demand and market price. There is no more nutriment in an ounce of protein or fat of the tenderloin of beef than in that of the round or shoulder. The protein of animal food does, however, have an advantage over that of vegetable foods. Animal foods, such as meats, fish, milk, and the like, gratify the palate in ways which most vegetable foods do not, and, what is perhaps of still greater weight in regulating the actual usage of communities by whose demand the prices are regulated, they sat-

## CHART 2.—PECUNIARY ECONOMY OF FOOD.

*Amounts of actually nutritive ingredients obtained in different food materials for 25 cents.*

[Amounts of nutrients in pounds. Fuel value in calories.]

| | Price per pound. | Food materials for 25 cents. | Weights of nutrients and calories of energy in 25 cents' worth |
|---|---|---|---|
| | *Cts.* | *Lbs.* | 1 Lb. 2000 Cal. · 3 Lbs 6000 Cal · 5 Lbs 10000 Cal |
| Beef, sirloin | 25.0 | 1.00 | |
| Beef, round | 15.0 | 1.67 | |
| Beef, neck | 6.0 | 4.17 | |
| Mutton, leg | 22.0 | 1.14 | |
| Ham, smoked | 16.0 | 1.56 | |
| Salt pork, very fat | 12.0 | 2.08 | |
| Codfish, fresh | 8.0 | 3.13 | |
| Codfish, salt | 7.0 | 3.57 | |
| Mackerel, salt | 12.0 | 2.08 | |
| Oysters, 35 cents quart | 18.0 | 1.43 | |
| Eggs, 25 cents dozen | 14.7 | 1.70 | |
| Milk, 7 cents quart | 3.5 | 7.14 | |
| Cheese, whole milk | 15.0 | 1.67 | |
| Cheese, skim milk | 8.0 | 3.13 | |
| Butter | 30.0 | 0.83 | |
| Sugar | 5.0 | 5.00 | |
| Wheat flour | 3.0 | 8.33 | |
| Wheat bread | 7.0 | 3.57 | |
| Corn meal | 2.5 | 10.00 | |
| Beans | 5.0 | 5.00 | |
| Potatoes | 1.2 | 20.00 | |
| Standard for daily diet for man at moderate work | | German.* | |
| | | American.† | |

* Voit. † Atwater.

isfy a real need by supplying protein and fats, which vegetable foods lack.

People who can afford it, the world over, will have animal foods, and will compete with one another in the prices they give for them. In general, the animal foods are more easily and completely digested than vegetable. There is doubtless good ground for paying somewhat more for the same quantity of nutritive material in the animal food.

For persons in good health the foods in which the nutrients are most expensive are like costly articles of adornment. People who can well afford them may be justified in buying them, but they are not economical.

### WASTE OF FOOD.

We waste food in two ways. We throw away a great deal, and many of us eat more than we need. That which is thrown away in the form of kitchen and table refuse does no harm, and in so far as it is used for feeding animals, or, in the case of fat, for making soap, it is not an absolute loss. That which we consume in excess of our needs is worse than wasted, because of the harm it does to the health.

In connection with studies of dietaries by the author and associates in New England, some observations have been made which bear upon this prevalent habit of throwing away valuable food. Thus, in the dietary of a carpenter 7.6 per cent of the total food purchased was left in the kitchen and table wastes. The total waste was somewhat worse than this proportion would imply, because it consisted mostly of the protein and fats, which are more costly than the carbohydrates. The waste contained about one tenth of the total protein and fat, and only one twenty-fifth of the total carbohydrates of the food; or, to put it in another way, the food purchased contained nearly 10 per cent more protein, 12 per cent more fat, and 5 per cent more carbohydrates than were eaten; and, worst of all, the wasted protein and fats were mostly from the meats, which supplied them in the costliest form.

From the statistics of the amounts and composition of the table and kitchen wastes of a boarding house at Middletown, Conn., it appears that these contained one ninth of the whole nutritive material of the food purchased. They included one

fifth of the protein and fats and one twentieth of the carbohydrates. Here again the rejected portions were mostly from the meats. Except in so far as parts of the waste were fed to chickens or possibly used for soap, it was simply thrown away. The boarding house was a very good one, the mistress was counted an excellent housekeeper, and the boarders were mechanics and other thrifty and industrious people with only moderate incomes.

In the studies of dietaries of students' clubs in Middletown it was necessary to determine the weight and composition of the rejected portion of meats. In buying meat in the retail markets in this region it is a common practice to have the bone and considerable of the fat cut out and left. In thus removing the "trimmings" the butcher is apt to cut out considerable else than the bone and fat. In a piece of roast beef weighing 16 pounds, the "trimmings," which consisted of the bone and meat cut out with it, and which were left for the butcher to sell to the soap man or get rid of as he might otherwise choose, weighed 4½ pounds, so that 11½ pounds of meat went to the consumer, who, of course, paid for the whole. The butcher said that he sold this sort of beef largely to the ordinary people of the city—mechanics, small tradesmen, and laborers; that many of his customers preferred not to take the "trimmings;" and that they were not exceptionally large in this case, either in amount or in proportion of meat and bone, for that cut of beef, which was the "rib roast." Inquiries of other meat men brought similar information.

The 4½ pounds of "trimmings" consisted of, approximately, 2¼ pounds of bone and ½ pound of tendon ("gristle"), which would make a most palatable and nutritious soup, and 1¾ pounds of meat, of which 1 pound was lean and ¾ pound fat. It is estimated that the nutritive materials of meat thus left unused, saying nothing of the bone and tendon, contained some 15 per cent of the protein and 10 per cent of the potential energy of the whole. The price of the beef was $2.24. Assuming the nutritive value of the ingredients of the "trimmings" to be 12½ per cent of the whole, 28 cents worth of the nutritive material, besides the bone and tendon, was left at the butcher's.

The common saying that "the average American family wastes as much food as a French family would live upon" is a great exaggeration, but statistics show that there is a great deal of truth in it. Even in some of the most economical families the amount of food wasted, if it could be collected for a month or a year, would prove to be very large, and in many cases the amount would be little less than enormous.

We endeavor to make our diet suit our palate by paying high prices in the market rather than by skilful cooking and tasteful serving at home. We buy more than we need, and what makes the matter worse, it is frequently those who most need to save that are the most wasteful.

The remedy for the evil so far as it applies to the chief item of our living expenses, our food, must be sought in two ways —in an understanding of the elementary facts regarding food and nutrition, and the acceptance of the doctrine that economy is not only respectable, but honorable.

## FOOD AND HEALTH.

The studies of dietaries thus far made are not sufficient for entirely reliable inferences regarding the eating habits of the people at large. The total number of dietaries examined is only a little over one hundred. They have been confined mostly to New England; only a small number of the examinations have been made with the needed accuracy; and it is worth noting that the ones in which the amounts and composition of the food have been most accurately determined are for the most part the ones in which the quantities were smallest, although some of the largest of the figures obtained were thought to represent very nearly the actual quantities.

Taking the results as they are, they very decidedly confirm the general impression of hygienists that our diet is one-sided, and that we eat too much. The food which we actually eat, leaving out of account that which we throw away, has relatively too little protein and too much fat, starch, and sugar. This is due partly to our large consumption of sugar and partly to our use of such large quantities of fat meats. The quantities of fat in the European dietaries, previously cited, range from 1 to 5 ounces per day, while in the American

the range is from 4 to 16 ounces. In the daily food of well-to-do professional men in Germany, amply nourished, the quantity of fat is from 3 to 4½ ounces per day; while in the dietaries of Americans in similar conditions of life it ranges from ·5 to 7½ ounces in the food purchased. The quantities of carbohydrates in the European dietaries range from 9 to 24 ounces, while in the corresponding American dietaries the carbohydrates were from 24 to 60 ounces.

In the American dietaries the ratio of fuel ingredients to one part of protein ranges from 6.6 to 8.2, and even higher. In the European dietaries of well-nourished people and in the dietary standards which express the average needs according to the teachings of the best physiological observations, it is from 4.1 to 6, or thereabouts. The rejection of so much of the fat of meat at the market and on our plates at the table is not mere wilfulness. It is in obedience to nature's protest against a one-sided and excessive diet.

How much harm is done to health by our one-sided and excessive diet no one can say. Physicians tell us that it is very great. Of the vice of overeating, as practised by the well-to-do classes, in England especially, Sir Henry Thompson, a noted English physician and authority on this subject, says:

"I have come to the conclusion that more than half the disease which embitters the middle and latter part of life is due to avoidable errors in diet, . . . and that more mischief in the form of actual disease, of impaired vigor, and of shortened life accrues to civilized man . . . in England and throughout central Europe from erroneous habits of eating than from the habitual use of alcoholic drink, considerable as I know that evil to be."

# THE WORLD'S CONGRESS OF MEDICO-CLIMATOLOGY.

*San Antonio, Tex., February 20th–22d,* 1896.

ABSTRACT OF PROCEEDINGS.*

THE CONGRESS convened, according to the announcement made in our February number.

The opening and only session for the day was called to order in the Young Men's Christian Association Hall shortly after two o'clock on Thursday, February 20th, by the Secretary, Dr. A. F. McKay, in the absence of the President, Professor J. A. Robinson, M.D., of Chicago. Dr. McKay stated that the Congress had been called for the purpose of bringing together physicians interested in studying the relation of climate to the cure of disease. It was organized, he said, at the Chicago Exposition, and was national and international in its character.

After stating the object of the Congress and the methods to be employed to accomplish them, he spoke of the difficulty Northern physicians had in leaving their homes at this time, and dwelt upon the opportunity the meeting of the Congress afforded the Texas physicians to study the wonderful climate of Texas.

A communication from the President was read, conveying an invitation to the delegates from the General Passenger Agent of the Arkansas Pass., to be the guests of that company, and to avail themselves of the occasion by short delays, to get a fair idea of the places of resort for health and pleasure in our Southwestern country.

Invitations were received and several accepted from citizens of San Antonio to visit clubs, institutions, and attractive scenery roundabout, and the session adjourned.

SECOND DAY.—*The Morning Session* was called to order by the Secretary at ten o'clock. The first paper read was a paper on "*The Climate of Georgia,*" by Dr. J. M. Goss, of Marietta,

* From Report of the San Antonio *Express.*

Ga. In the absence of Dr. Goss it was read by Dr. McKay, and was followed by general discussion.

Dr. C. D. Hurt, of Atlanta, said that, as an "all the year climate," he thought Northern Georgia compared very favorably with other sections. He did not agree with Dr. Goss that Georgia was a good place for consumption except at certain periods of the year. Considering its geographical and topographical relation, the climate of Georgia afforded as much immunity from the extreme heat of summer and the rigor of winter as almost any section of the country.

Dr. James L. Acomb, of Tideout, Pa., asked if a climate that produced catarrhal diseases was good for consumption.

Dr. Paul Paquin, of St. Louis, thought that catarrhal diseases furnished a field for the development of consumptive germs, which had been found by *post mortem* examinations to be present in a large number of people in which they are never developed. He thought the most equable climate the most beneficial to consumption. He regretted that so much misapprehension existed about health resorts. He said he had been making a special study of climates and had patients in Georgia, Colorado, Arizona, New Mexico, San Antonio, and other places, and thought the work undertaken by the Congress would be of great value to the profession in enabling them to determine where to send their patients. There should be absolute integrity in the preparation of information about health resorts, and he deplored the fact that much of the information about many resorts was not reliable, having in many cases been prepared by railroads, and could not be relied on.

The next paper was on "*The Medico-Climatologist and What is Expected of Him*," by Dr. A. F. McKay, of Chicago, Secretary of the Congress.

Emerson was not far from literal fact when he said: "Set ten men to write their journal for one day, and nine out of the ten will leave out their own thought, that is their net experience, and lose themselves in misreporting the supposed experience of other people." If we could but stop asking what is the proper, the conventional, or the fashionable thing to do and follow less the theories of those who misreport the San Antonio River, we should be the better able to reach sanitary conclusions.

Our people are supplied with the best of drinking water, furnished by one of the grandest waterworks systems in the State. The Waterworks Company has in place over one hundred miles of large mains from 6 to 24 inches, with a small portion of 4-inch mains. There are in daily operation four artesian wells at the head of the river and five artesian wells on Market Street Station. The pumping supply during the summer is 7,000,000 gallons daily, and in winter 4,000,000 gallons daily. A large pumping plant is now being erected at the Market Street headquarters capable of supplying 4,000,000 to 5,000,000 gallons daily in addition to the electric pumps in place there, these being in addition to the plant at the head of the river. Our sanitary sewerage system construction under Samuel M. Gray, Providence, R. I., is completed up to 23 miles, and about 52 miles of sewer canals are yet to be constructed.

Tourists from nearly all over the world have always pronounced San Antonio as a very handsome, attractive, and agreeable city, and the yearly and daily influx of health and pleasure-seeking Northern people amply attest to the salubriousness and invigorating influences of our climate and speak highly of the good reception and treatment by our people.

It is safe to state that there is hardly any other city in the great State of Texas that has more widely known places of public resort, historic reminiscences and finer plazas and parks than our old San Antonio. Who has not heard of the historic, bullet and weather-stained Alamo and the various Spanish missions nearly two hundred years old, including San Fernando Cathedral, on Main Plaza, the San Pedro Springs Park, with its picturesque pecan and oak groves, sparkling springs and zoological garden ; the famous Brackenridge place at the head of the river, where the stream has its origin from a rocky region covered the year round with tropical plants, oak and hackberry trees hundreds of years old, and winding its way downward through the heart of the city to empty into the Gulf of Mexico? And who has not heard of San Antonio's government post, with its fine drill grounds and its tower, affording a grand view over the city and the far distant prairies covered in the far western horizon with the evergreen and lovely hills of the Leona, and eastward with the beautiful pecan and oak groves of the Salado?

And none are less proud than San Antonians themselves of our city improvements. The city has an area of 36 square miles; miles of streets, 320; miles of hydrant water mains, 165; number of fire hydrants, 792; miles of gas mains, 35; miles of sewer canals in construction up to February, 23; miles of telephone wires, 162; miles of electric wires, 165; number of electric lights in houses, 10,900; number of electric lights in streets, 209; number of private electric arc lamps in city, 130; number of gallons of artesian well water used by the populace for household, drinking, baths, etc., per month, 14,000,000; number of bridges across its river, 13; improved parks, 15; improved plazas, 7; fire-engine houses, 6; meat markets, 74; breweries, 4; newspapers, 18; drug stores, including free dispensaries, 38; hospitals and infirmaries, 4; public schools, 20; churches, 40.

San Antonio ranks first among the Texas cities in wealth, trade, and population. Our educational facilities are of a high order, and our public school system is very ably managed. The superintendents are strict as to the hygienic condition of the schools and health of the children, the compulsory vaccination is required of all children entering school. Our health department is kept up to its requirements, especial attention being given to the vital statistic and garbage department. Last year the city employed 12 scavenger carts and 8 sanitary inspectors. There were hauled 11,300 loads of garbage, including 3651 animals, outside of the city to the dumping place at the rock quarries, three miles northwest of the city, where it is burned as much as possible. These rock quarries are situated in a very romantic and hilly region covered with evergreen shrubbery and oak trees, and the basement of these immense large and circular excavations, surrounded by imposing hard rock cliffs over thirty feet high remind one of the old Roman amphitheatres used for their wild beasts and torture exhibitions.

The city is justly proud of its fine City Hall, federal Post-Office building, and the new county Court House, all being models of modern architecture, and all are situated in the rear of the three well-paved plazas, one on Military Plaza, fronting the ancient San Fernando Cathedral, the other on Main Plaza near the river, and the federal building on Alamo Plaza, in

the rear of the renowned old Alamo building. We have a fine well-equipped Opera House, a German Casino, which is one of our oldest social institutions of San Antonio, and Turner Hall, both the pride of our German populace, and lovers of genuine music and singing can be accommodated by one of the best music halls in all Texas, the Beethoven Maennerchor Hall, a very handsome building on South Alamo Street, opposite our German-English school.

Although not exactly a large factory town, San Antonio promises to become one in the very near future, and the city is supplied with quite a number of fine factories, all prospering.

Our police department, with headquarters at the City Hall, is highly commented upon for its excellent management, and our fire department is very favorably equipped with all modern appliances.

We have a large number of public resorts and fine drives to the suburban additions, all of which, and especially East End, Laurel Heights, the Missions, San Pedro Springs Park, Grand Avenue and Riverside Park, West End with its fine, picturesque lake and residences, and a modern well-equipped sanitarium, and a host of other places too numerous to mention, have given our people and guests ample opportunity to enjoy the fine climate and nature's paradise around San Antonio.

In the discussion that followed, Dr. T. J. Bennett, of Austin, said he thought physicians should have the best and most reliable information about the various health resorts, and he thought their information should come from a disinterested source.

Adjourned.

*The Afternoon Session* convened at 2.30.

SAN ANTONIO.

Dr. W. S. Rowley introduced Judge C. A. Keller, who welcomed the delegates to San Antonio. Judge Keller said :

"Gentlemen of the Medico-Climatological Congress, Dr. Swearingen, of Austin, a member of the State Board of Health, and one of the most eloquent members of your profession in the State, was originally selected to welcome you,

but unfortunately he is unable to be present to-day, and at the last moment I have been drafted into service to fill his place; and when I have finished you will doubtless join with me in regretting the eloquent doctor's absence.

"From the East, the North, the West, and the South you have assembled to do an important work, and in behalf of the local physicians I greet you and bid you welcome; and at the request of the Mayor I extend to you the freedom of the city.

"I welcome you to a city of toilers, to a city full of working men's homes. San Antonio is 'home, sweet home' to more than 50,000 souls, and nowhere else can you find a city with the same population with so many families living in their own homes. They belong to that great mass of humanity, neither rich nor poor, but better than either, that comprises the brawn and brain of the race, and does the business of the world.

"Our city is one of the oldest in America, and is essentially cosmopolitan. You can find many places of interest to visit in this vicinity, and we trust you will avail yourselves of the opportunity while in our midst. We have a beautiful little river that rises three miles north, and winds all through our city in a course as crooked as the pathway of a modern politician. We have the largest government post in the United States; more miles of electric street railway than any city of its size in the Union; a territory tributary to us larger than the State of New York; a population composed of representatives from nearly every nation on earth; the finest artesian wells in the State; and some of the oldest missions on the continent. We probably have more freedom of opinion and less of political partisanship than any other city in the nation. For more than ten years no political party has nominated a local ticket, although the voting population is about equally divided politically. Our people have inherited a love of liberty, and nowhere in all this broad land can a man more freely and fully exercise and enjoy his social, religious, and political rights than here in San Antonio.

"If you were to draw a circle one mile in diameter, with this building as its centre, you would embrace an area upon which more battles have been fought, and over which more different national flags have floated than any other spot in Amer-

ica. You meet to-day within a stone's throw of a building made famous by the brave deeds of our countrymen, and whose walls have again and again been baptized with the blood of heroic men. As Texans we visit the Alamo and look upon it with awe, and remember with admiration and love Travis, and Crockett, and Bowie, and the others of that Spartan band that so freely gave up their lives that liberty might live.

"Here, almost within the shadow of that grand old battle-scarred building, made glorious by its baptism in the blood of heroes, who, Christ-like, chose to die for the good of others; here, upon ground made sacred by all who love liberty, we come to welcome you as the representatives of a profession that has faced death for the good of mankind as earnestly and as bravely as those who died within that historic building. Wherever pestilence or deadly scourge has smitten the human family, there can be found members of your profession, faithfully and fearlessly facing danger in a more appalling form than that which follows the carnage of war. They take their lives in their hands and fight back grim death, protect the living and minister unto the suffering and dying. As the representatives of such a profession we are proud to welcome you to our city and our homes.

"There is one thing, however, we can boast of that is greater and better for us as a people than all these, and one probably of more interest to you, and that is our climate. We have more good climate to the square acre in Southwest Texas than anywhere else in the United States. If our climate could be used as assets, Texas would be the richest as well as the grandest State in the Union. To you who come from the North, with the thermometer below zero and a blizzard raging, a day like yesterday must be a pleasant surprise; but let me assure you it was but a sample of our usual weather in this 'Italy of America,' and was not specially provided for the occasion in order to get a favorable report from your body. . . .

"I trust your visit among us may be pleasant; that your deliberations will be fruitful in good work, and that in after years you may look back upon your brief sojourn in the Alamo City as a green spot in your memories. In behalf of the local physicians and of His Honor the Mayor, and of all

our people, I again bid you welcome to the metropolis of the grandest State of the greatest nation under the sun."

In the absence of Dr. Robinson, of Chicago, President Dr. C. D. Hurt, representing the Georgia State Medical Society, was elected president *pro tem.*

On motion of Dr. A. F. McKay a vote of thanks was tendered Judge C. A. Keller for his address of welcome.

## CLIMATE AND CHILDREN.

Dr. Milton J. Bleim, of San Antonio, read a paper on "*The Climate of Southwest Texas in its Relation to the Diseases of Children,*" as follows:

This is a subject upon which one can write with honest enthusiasm. Compared with many sections of our country which are constantly suffering from the ravages of the diseases peculiar to childhood, Southwest Texas is a veritable children's paradise. For one thing, the mildness of the climate makes it possible for children to spend practically the whole year out of doors. What this must mean to delicate children can easily be imagined. Not only can the constant inspiration of pure air thus be insured, but also the maximum amount of that active life which is so necessary to their growing bodies.

Especially essential is this free, active outdoor life to children who are either predisposed by heredity to diseases of the respiratory system or who have unfortunately acquired obstinate troubles of this kind. Such children almost without exception do well in this climate. Even if they take colds and suffer relapses they are able to recover themselves far more easily than in severer climates. In many cases a single residence here of one winter suffices to cure permanently cases of bronchitis or asthma, even of some years' standing.

But it is in the remarkable record made here by the ordinary diseases of childhood to which your attention is especially desired. These diseases rarely appear in epidemic form. They are seldom fatal. They are generally very mild in character, even when generally prevalent. While at different times during the past five years one or the other of these diseases has been quite prevalent only one has taken the form of epidemic —viz., measles, in 1894, which resulted in a mortality quite out of proportion to the ordinary record. Fortunately, the

record kept by the Health Department of the city of San Antonio enables me to confirm these claims by precise data. Unfortunately there is one serious omission in these records which is due to the fact that on account of the usual mildness of these infectious diseases the law providing for the reporting of cases is not enforced ; I cannot therefore give the number of cases occurring, but only the mortality. The facts are presented in the following table :

TABLE OF MORTALITY FROM ACUTE INFECTIOUS DISEASES OF CHILDHOOD IN SAN ANTONIO, TEX., 1891-95.

| | 1891. | 1892. | 1893. | 1894. | 1895. | Total. |
|---|---|---|---|---|---|---|
| Population (estimated) | 52,000 | 52,000 | 54,000 | 56,000 | 60,000 | 0 |
| School population | 10,694 | 11,203 | 11,455 | 12,012 | 12,612 | 0 |
| Scarlet fever | 0 | 0 | 0 | 0 | 3 | 3 |
| Measles | 0 | 4 | 0 | 45 | 1 | 50 |
| Whooping cough | 0 | 0 | 0 | 1 | 3 | 4 |
| Croup | 1 | 0 | 1 | 2 | 4 | 8 |
| Diphtheria | 3 | 2 | 6 | 2 | 3 | 16 |
| Total | 4 | 6 | 7 | 50 | 14 | 81 |
| Total from all causes | 1,160 | 1,436 | 1,098 | 1,205 | 1,181 | 6,080 |

Here we have a city of from 50,000 to 60,000 inhabitants. We have a pure water supply by the artesian system. But our sewerage system is as yet in process of construction. We have a population of 5000 negroes and 15,000 Mexicans. Many of the latter especially live in the most abject poverty and in a most unsanitary manner. Surely under such circumstances that climate must indeed be salubrious that will yield up but 81 victims in five years to the dreaded infectious diseases of childhood, only 81 out of a total number of 6080 deaths.

Taking the facts somewhat more in detail, we find but one in the last five years in which scarlet-fever caused any deaths ; and then only three. Likewise in whooping-cough there were three years of freedom and in the other two but four deaths.

Of measles, so prolific of deaths in Northern latitudes, there were two years in which none occurred. In 1894 an epidemic of this disease claimed 45 children. It would be very valuable could we know the number of cases attacked. I have examined the records carefully and find that fully 30 of these deaths occurred among negro and Mexican children, mostly from intestinal and brain complications, or one third of the popula-

tion furnished two thirds of the deaths from measles. Croup caused 8 deaths; one year none. Coming now to that voracious monster, diphtheria, more dreaded to-day than all the other diseases combined, we find a most remarkable showing —only 16 deaths in the last five years! This is a city of 60,000 people, with the sanitary conditions mentioned, with a school population of 12,000 children, is, I say again, a most remarkable record. We find, too, that these deaths are very evenly distributed throughout these years, showing that there is no tendency to epidemics. It was supposed that the opening of sewer trenches during 1895 would greatly increase the fatality from diphtheria, but this happily did not result. Let us compare these figures with some such city as Chicago. In 1895 Chicago lost 1800 children (mostly) from diphtheria; and this in spite of antitoxin. Granting a population of 1,800,000, this would give us one death for every 1000 of the population. In San Antonio the rate was 3 to 60,000, or 1 to 20,000, or, in other words, 20 children die of diphtheria in Chicago to 1 in San Antonio. With better sanitary conditions soon to obtain even this rate should be reduced.

The chief mortality among children under five years is due to the various diseases of the digestive system. Under the various diagnoses of cholera infantum, enteritis, gastro-enteritis, colitis, entero-colitis, diarrhœa and dysentery, we find recorded in 1894, 74 deaths (under five years), and in 1895, 90 deaths. It would be more instructive if we could make comparison with the death-rate from these diseases in other climates. It is, however, the impression of physicians who have practised here and elsewhere, that these diseases also are not so extensively prevalent nor so fatal as in the more humid and changeable summers elsewhere. That is also my own opinion based upon experience in the North and South.

In conclusion I think I may safely assert that children have in the climate of Southwest Texas a chance for life and for the enjoyment of life which makes it indeed the "children's paradise."

Dr. Bliem's paper was discussed by Dr. McKay, of Chicago, who said that the paper was a remarkable showing and to the great credit of San Antonio.

Dr. J. A. Acomb, of Pennsylvania, said the showing was

remarkable, and that he had never heard or read of anything equalling it, and that it was a most creditable showing for San Antonio as a health resort.

Dr. Paul Paquin, of St. Louis, agreed that it was a remarkable showing, and said he could not recall an instance of such a low mortality from diphtheria. He said it spoke volumes for the natural condition of San Antonio, and he was especially gratified, as he had himself brought a little child here to be benefited.

Dr. Rudolf Menger, city physician of San Antonio, read a paper on "*Health Affairs: Climate and Meteorological Conditions, the History, Resources and Advantages of San Antonio,*" which we purpose to publish in full in our next number.

(*To be continued.*)

## SOME FALLACIES OF THE TRAP VENT-PIPE SYSTEM.

By J. W. HUGHES, of Montreal, Member of American Public Health Association, Montreal Sanitary Association, Montreal Master Plumbers' Association, etc.

COMPLETE and continuous ventilation through every part of the waste system is the Utopian ideal of the sanitary expert; and the popular belief is that such circu ation is secured by the observance of the commonly accepted rules for house drainage, of which the trap vent-pipe system is a part. But this belief is a delusion, as it is simply impossible to maintain such circulation in the several parts of a pipe system constructed in accordance with these rules, especially where there are two or more vertical lines of pipe, where there are fixtures on two or more floors, or where there are many fixtures connected with the same system.

It will be observed that the entire drainage system of each building, whether large of small, is discharged through a *single outlet*, and usually, though not always, disconnected from the sewer at the cellar wall by a running trap, with a fresh-air inlet connected with the drain on the house side of the trap, and extending to the outer air, generally at the street curb. But the presence or absence of this trap and foot vent is not material to the question at issue.

It must be remembered that the circulation through these pipes is mainly dependent on the difference of temperature between the outer air and the air in the pipes. In winter, when the outer air is cold and the air in the pipes is warm, an upward current may be traced in one or more of the rising lines, while those more remote will show little or no circulation, for the reason that the single source of supply—the fresh-air inlet or the drain—is too limited to meet the demand in several rising lines, and in which there is liable to be considerable difference of resistance. In summer, when the air in the pipes is frequently colder than the outer air, either complete stagnation or a positive downward flow will occur, usually the latter. Hence, it is evident that much of the

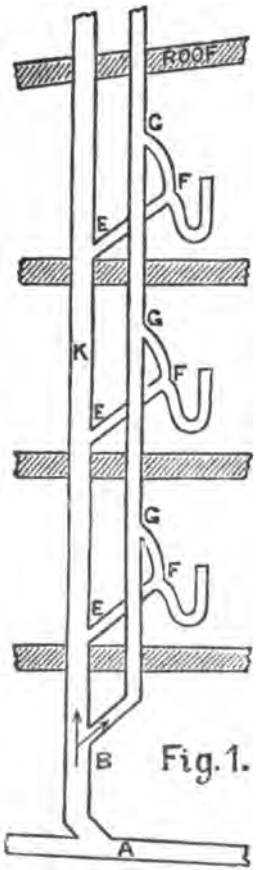


Fig. 1.

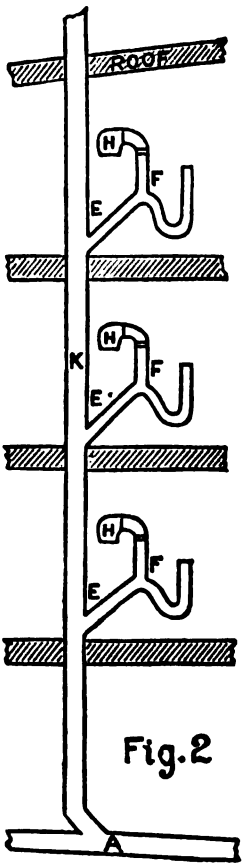


Fig. 2

waste system will always be filled with *dead air*, moved only fitfully by the discharge of fixtures or changes of temperature; and this condition will be the more marked in large buildings where there are many rising lines of pipes.

But even when an upward air current does exist in the soil pipe no movement of the air in the branches between the soil and vent pipes will occur, from the fact that no provision is made to supply the increased volume of air necessary to establish and maintain such current. For example:

Fig. 1 illustrates the usual lines of soil and vent pipes, branches, traps and connections, and will doubtless be accepted as an ideal illustration of the trap vent-pipe system.

*A* represents the horizontal soil pipe or drain through which the air must pass before it reaches the rising lines. If the vertical soil pipe *K* is four inches in diameter and the trap vent pipe three inches, then 36 per cent of the air is diverted at *B* into the vent pipe, where it ceases to perform any useful function. Hence it is obvious that the upward current and aëration in the soil pipe above this point will be reduced more than one third.

At *E E E* are three branches to which are attached traps vented at *F F F* into the vent pipe at *G G G* in the usual way.

As the rising current of air in the two pipes is necessarily equal in pressure, density, etc., and the capacity of the soil pipe is of uniform calibre to the top, it will require all its contained air to maintain an equal pressure and air current with that of the vent pipe; and unless the vent pipe were enlarged above each branch, it would be incapable of receiving any of the soil pipe air, because such increase would destroy its equilibrium with that of the soil pipe.

If the soil pipe were reduced in size at *E E E*, and the vent pipe correspondingly increased at *G G G*, then the amount of air proportioned to the changed capacities in the pipes would be diverted at each of the branches from the soil pipe at *E E E* to the vent pipe at *G G G*, but this would so reduce the upper portion of the soil pipe as to render it incapable of performing its function. Thus the absurdity of the theory becomes self-evident.

On the other hand, if each of the traps were vented *automatically*, as shown in Fig. 2, since the same amount of air

must pass through the horizontal soil pipe in each instance, and as none would be diverted from it at any point, the aëration and air current would be 50 per cent greater than in the corresponding soil pipe in Fig. 1. But the actual difference would be much greater than this, because every time there is a slight minus pressure in the pipe caused by the discharge of a fixture, or by a strong air current passing over the top of the soil pipe, large volumes of air would be drawn into the pipe through the automatic vents, and thus leave the branches filled with *fresh air*, which is impossible under the trap vent-pipe system.

Now let us suppose the horizontal soil pipe extended and other rising lines attached, certainly very little circulation could be expected in any of these for the simple reason that the first rising line would furnish adequate capacity and the most direct route for the escape of the received air.

Here, again, great advantage is secured by venting the traps automatically, since much fresh air is thus drawn into the pipes, while little or no circulation is possible under the trap vent-pipe system.

These facts show the advantage of this *method* over all others as a means of aëration of the waste system ; while the exhaustive researches in trap siphonage by Professor James E. Denton, in the Department of Tests at the Stevens Institute of Technology, demonstrate beyond question the practical superiority of a properly constructed automatic device, not only as a means of aëration of the pipes, but as the *only* known means that will preserve the trap seal against siphonage in all the conditions occurring in plumbing practice.

Finally, it may be added that automatic devices have long been used by leading plumbers both in the United States and Canada with perfect success and safety, at the same time effecting a great saving in the cost of fitting and doing away with the increased risk always run when pipes with their many joints and fittings are used. In our cold climate the automatic vent is especially useful and to be relied upon when the ordinary back air vent will be hermetically sealed by frost.—*Montreal Builder.*

# MEDICAL EXCERPT.

By T. P. Corbally, A.M., M.D.

Chronic Coffee Intoxication.—This subject seems not to have received the attention it deserves. A writer in the *Anales del Departamento Nacional de Higiene*, Buenos Ayres, December, 1895, calls attention to it as follows:

The conditions accompanying chronic poisoning with coffee are not well known, they are indeed almost entirely ignored. The most recent works on pathology make no reference to it whatever, and yet it deserves to be known by the profession, for sometimes inattention to it may lead to errors in diagnosis very disadvantageous to the patient.

Chronic coffeeism is almost always confounded with disturbance of digestion due to alcohol, particularly with regard to the effects of this agent on the stomach and nervous system. The cause of this is that both intoxicants produce effects that are very similar.

Dr. Guelliot, of Reims, in 1885 called attention to the danger of coffee intoxication in a publication which, although very complete, was allowed to pass without notice.

Coffee intoxication is manifested principally by disturbance of the digestive organs and of the nervous system.

Dyspepsia from coffee poisoning resembles very much, in its symptoms, the phenomena that accompany alcoholic gastritis, with mucous discharge in the morning, pain in the epigastric region, coated tongue, and great loss of appetite, and the loathing of solid food is such that finally little more is taken than bread soaked in coffee.

By continuing this habit the absorption of the poison is increased, and the intoxication is more and more marked. Nausea and vomiting, acid eructations, sometimes very painful, follow, and the habitue becomes much emaciated and falls into the condition which Guelliot calls "coffeeic cachexia."

The organs of circulation are affected. The condition most frequently noticed is an unusually slow pulse. Palpitation is rare.

Nervous disturbances are frequent, and in regard to im-

portance must be placed in the same class with the disturbance of the digestive organs.

Wakefulness supervenes, and when sleep occurs it is interrupted by horrid dreams, or those of a character which give rise to the suspicion of alcoholism.

Sometimes there is a very noticeable trembling in both the upper and lower limbs, a quivering of the lips and of the tongue, which may become general with violent twitching in the other muscles of the face. Very painful cramps occur in the large muscles of the legs.

There is often disturbance of sensation, but in some cases this is not very well marked.

Disturbances of the genito-urinary organs have been observed, though they are not frequent. Finally, in children a marked defect of development has been observed.

The different forms of intoxication from coffee are not persistent. The discontinuance of the use of the poison is rapidly followed by improvement; one that is certainly much more rapid than when the intoxication arises from the use of alcohol.

As may be seen, these disturbances deserve the attention of the physician, and their recognition is of the highest importance, since when the cause is known it is sufficient to stop its use to find the effects disappear rapidly.

THEOBROMINE.—M. Huchard sums up, in the following manner (*La France Médicale*, February 28th, 1896), the therapeutic action of theobromine.

1. It should be placed in the class of functional epithelial diuretics, of Manquat, and its action on the kidneys is perfectly harmless.

2. It has no influence on the action of the heart, the blood vessels, the nervous system, and causes no cerebral excitement.

3. It has very little toxic properties, even in large doses.

4. The duration of its diuretic action is less than that of digitalis, but longer than that of caffeine.

5. It very rarely causes digestive troubles, especially if given in capsules of 50 centigrams.

6. There is no fear of becoming habituated to its use, nor any of accumulation.

7. Its employment is indicated in dropsy of cardiac origin, and even in the anasarca following Bright's.

M. Huchard prescribes it in doses of 3 to 5 grams during four days only, in capsules of 50 centigrams. Take 8 capsules the first day, 6 the second and the third, and 4 the last.

Theobromine may be used as a tonic if prescribed in small doses, and continued for several weeks, especially if combined with phosphate of soda ; 4 to 5 grains of each before meals.

CHRONIC HEADACHE TREATED WITH CALOMEL.—M. Galliard has described (*Le Progrès Médicale*, February 29th, 1896) a special form of rebellious headache, distinct from migraine, of which it has neither the well-defined paroxysms, nor the vertigo, nor the inclination to nausea ; is distinct from syphilitic headache, of which it has not the nocturnal paroxysms ; distinct from the persistent headaches of neurasthenia, by the absence of the stigmata of neurasthenia. This headache yields readily to calomel, given fasting, in the morning, in doses of 0 gram 10 centigram, for six days consecutively, watching carefully the effect on the mouth and for excessive diarrhœa.

If not successful, from inability to continue treatment, a last attempt may be made after the lapse of a few weeks. If this also fails, it is useless to make a third attempt.

INSOMNIA IN GASTRO-INTESTINAL DISORDERS.— Sleeplessness is a condition frequently present in some disorders of the gastro-intestinal tract. Owing to the imperfect digestion in these cases, and the fermentative process in the stomach and intestinal canal, certain toxic substances are formed which, when absorbed and carried into the circulation, irritate the nervous system and produce excitation and wakefulness. Of course, the rational treatment in this condition consists in the administration of evacuants and antiseptics, and of drugs which will regulate the disordered digestive process. The insomnia, however, is often so prominent and troublesome a feature as to demand relief. In a recent editorial in the *Daily Lancet* attention is called to the fact that sulfonal is particularly suitable as a hypnotic for those patients. A combination which is recommended as singularly efficacious in cases of

so-called biliousness, associated with restlessness or wakefulness, is the following: Sulfonal, gr. 10, Hydrarg. Chlor. Mit. gr. 1., Sacchar. alb. gr. 20, M et ft. chart. No. 10. Sig.: One every hour.

FOR CHILDREN, in particular, requiring an anodyne or hypnotic, H. H. Powell, M.D., Professor of Obstetrics and Diseases of Children, Cleveland Medical College, Cleveland, O., recommends *Bromidia*. It acts promptly, producing refreshing sleep, without suppressing the secretions or being followed by the frequent disagreeable after-effects of opium.

THE PRACTICAL RESULTS OF THE ANTITOXIN TREATMENT OF DIPHTHERIA.—Taking all cases reported together (J. M. French, M.D., *Medical and Surgical Reporter*, February 22d, 1896), during its first year's use, so far as can be judged at the present time, has been to lessen the death-rate from diphtheria in cases where it has been used nearly or quite one half, thus proving itself beyond all doubt to be the most successful of any known treatment for this dread disease. It is confidently predicted that the results will be even more favorable the second year, owing to improvements in the methods of preparing, preserving, and administering the serum. There is also every reason to anticipate that the same success which now attends the treatment of diphtheria by the serum method will soon be attained in the cases of a number of the other specific diseases.

SERUM TREATMENT OF TYPHOID-FEVER has been made the subject of an important communication to the Société de Biologie (*Progrès Médicale*, February 29th, 1896), by M. Chantemesse. He first reminded the Société that, from the time of his earliest experiments made with M. Widal, on the bacillus of typhoid-fever, he entertained the idea of discovering a process by which he would be able to attenuate the virulence of these bacilli. Now, by using the virulent cultures, he has found that horses can be fully protected from the effects, and yet the serum is at the end of a year still very active and toxic in small doses for the guinea-pig. This is the serum which was used in three cases of typhoid in man,

and has afforded the opportunity of observing a prompt arrest of the disease.

There is then, notwithstanding the small number of cases in which it has been tried, an active serotherapic agent efficient in typhoid-fever which is destined certainly to take the place of all the methods of treatment now in use.

EXPERIMENTAL APPENDICITIS.—M. Dieulafoy (*La France Médicale*, February 14th, 1896) recently addressed the Société Médicale des Hôpitaux, as follows: "I ask the permission of the Society to detail briefly the conclusions at which I arrived, as expressed in the thirteen lectures which I delivered in November and December, on the important question of appendicitis. The conclusions are as follows:

"1. Appendicitis is always the result of the transformation of the duct of the appendix into a *closed cavity*.

"2. This transformation may take place at any point in the duct leading to the appendix.

"3. Most frequently it is due to the slow and progressive formation of a calculus in the appendix. It is here a question not of a calculus coming from the cœcum, as has been heretofore erroneously supposed, but a true lithiasis of the appendix, justly comparable with biliary and renal lithiasis, and one that I propose to register among the productions of gout and arthritis.

"4. In other circumstances the transformation of the appendicular canal into a closed cavity is the consequence of a local infection, exactly comparable with the obliteration of the biliary ducts in the case of jaundice called catarrhal. Finally, in some cases it is the result of a slow and progressive fibrous constriction, analogous to the stricture of the canal of the urethra. Many of these causes may be found to exist in the same subject.

"5. The symptoms of appendicitis, whether benign or grave, mild or violent, do not break out until the transformation within the closed cavity is established. As soon as this change takes place the normal microbes of the appendix, up to that time harmless, swarm in vast numbers, and their virulence is intensely increased.

"6. In the appendix thus transformed a centre of infection

is developed, often terrible in its effects; the principal microbes as agents are the colibacillus and the streptococcus.

"7. The virulence of the inflammation of the appendix is sometimes so great that the patient succumbs from the effects of the infection itself, other lesions besides peritonitis having scarcely made their appearance.

"8. In other cases the infection extends from the appendix toward the peritonitis, the walls of the appendix not being perforated; yet, notwithstanding this absence of perforation, all the different varieties of peritonitis may be seen to suddenly burst forth.

"9. In cases that are considered purely classical, the best known, disease of the appendix, terminates in gangrene, in perforation, or in peritonitis.

"10. It is in accordance with the investigations here briefly stated that I have formed the theory of appendicitis caused by a closed cavity in man, a theory confirmed in the rabbit by the interesting experiments of MM. Roger and Josué."

TETANUS, CURARE AND STRYCHNIN.—M. Laborde presented to the Société de Biologie (*Gazette Hebdomadaire*, February 9th, 1896) two frogs, to the first of which half a milligram of the extract of curare was administered by injection, and to the second a quarter of a milligram of the hydrochlorate of strychnin. If to the first frog, while under the influence of curare, a quarter of a milligram of strychnin be injected, there is no sign of tetanus from the strychnin.

On the other hand, if into the second frog, suffering with tetanus, the dose of curare, administered as a preventive to the first, be injected, the tetanic state ceases completely in a few minutes.

The result shows that curare possesses both a preventive and a curative action on the poison of tetanus.

LIFE OF DISEASE GERMS IN THE SOIL.—A published investigation, attributed to Dr. Lösener, indicates that typhoid bacilli may survive in a buried corpse for 95 days, cholera vibrios for not more than 28 days, tubercle bacilli from 95 to 123 days, tetanus bacilli more than 234 days, but not over 361 days, and anthrax germs for a full year or more. Only anthrax germs found their way to the adjacent soil or water.

# EDITOR'S TABLE.

## SANITARIAN, APRIL NUMBER, 1896.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

### THE EVOLUTION OF A NATIONAL HEALTH SERVICE.*

IT had its inception at the first American conference ever convened for the promotion of practical sanitation : the Quarantine Convention, at Philadelphia, May 13th–15th, 1857.

The call of that Convention was in virtue of a resolution adopted by the Philadelphia Board of Health, October 29th, 1856, at the instance of Dr. Wilson Jewell, a member of the Board, as follows :

"*Resolved*, That a committee of three, with the President, be appointed to correspond with the boards of health of New York, Boston, Baltimore, and New Orleans, on the propriety of calling a convention of delegates from the various boards of health in the maritime cities of the United States, for the purpose of conference in relation to the establishment of a uniform system of revised quarantine laws."

This action reflected the most recent illustration of the utter futility, aye, the common danger of quarantine, as at that time and as it had been hitherto practised, the epidemic of yellow-fever on the Bay shore of Long Island in the summer and autumn of the same year, communicated by the New York Quarantine.

The conference consisted of seventy-three delegates from nine States, representing the principal boards of health and chief commercial bodies of those States. The single purpose for which the conference was called, however, was at the outset based upon scientific research and observation.

There were delegates present familiar with reforms at that time in progress in France, in virtue of a royal ordinance in 1847, which declared that, as measured by accepted truths based upon the opinions of medical men, many of the restric-

* The reorganized United States Marine Hospital Service.

tions of quarantine were unnecessarily burdensome, and ought therefore to be abolished; and with the radical action of the General Board of Health of England, authorized by Act of Parliament in 1848, protesting that protection from pestilential diseases does not consist in quarantine regulations alone, but more in internal sanitary measures—measures which have for their object the suppression and prevention of conditions without which the diseases regarded as quarantinable would not exist. Alive to such declarations and the salutary results of their enforcement abroad, the word quarantine was deprived of its significance in the call of the conference, and relegated to a subordinate place. A series of propositions was introduced instead, which, as elaborated in the three National Sanitary and Quarantine conventions that followed, embraces what may be properly esteemed the Institutes of Preventive Medicine in America.

The initiatory propositions at the first conference were in part substantially as follows:

When pestilential diseases are introduced from abroad they cannot become epidemic, unless there exist in the community the circumstances which are calculated to produce such diseases, independent of their importation.

Efficient sanitary measures, including quarantine, will in most cases prevent the introduction of these diseases, and prevent their extension when introduced.

The second conference, held in Baltimore, April 29th–May 1st, 1858, which was more largely attended, besides taking action on the reports of committees on the important subjects of the previous conference, and continuing the work then undertaken, appointed two committees on singularly comprehensive subjects:

I. The Internal Hygiene of Cities, with particular regard to the following points:

1. A complete and efficient system of registrations of births, marriages, and deaths, . . . and the necessary connection of such a system with sanitary measures.

2. Disinfectants, their character and benefits in connection with sanitary measures.

3. The Importance of an Ample Water Supply, Adequate Sewerage and the Proper Disposal of Offal.

4. Importance and Economy of Sanitary Measures in Cities. This committee was also instructed to consider in their report Vaccination and Re-Vaccination, with a view to the enactment of laws for the enforcement of general Vaccination and Re-Vaccination.

II. External Hygiene, comprising—

1. A History of Quarantine.

2. Have Quarantines secured the object for which they were originally intended? If not, the reasons of their failure.

3. What reforms are required to make quarantines more efficient and less burdensome?

4. Is a uniform system of Quarantine Laws feasible? If so, to propose a plan by which the object may be accomplished.

The committee reports and discussion on these and kindred subjects, at the third annual conference, held in New York, April 27th–30th, 1859 (comprehended in an octavo volume of over seven hundred pages), constitute the most important contribution to the progress of sanitary reform hitherto published in this country.

This conference was attended by about two hundred delegates from ten States, District of Columbia, Canada, and one from Scotland, D. B. Reid, a distinguished sanitary architect, representing upward of fifty boards of health, medical organizations and institutions, and commercial bodies.

It was remarkable for the large proportion of distinguished physicians from a distance, as well as residential, the number of mayors and other distinguished citizens who were present as delegates and participated in the proceedings.

The committee reports on Quarantine, Internal Hygiene of Cities, Sewerage, Water Supplies, Disposal of Offal, Importance and Economy of Sanitary Measures, were all accepted as valuable contributions to preventive medicine, but as steps only in the progress of the work that had been undertaken. Their importance was emphasized by discussion, and the subjects were continued under the same or invigorated committees, and several new subjects added, with carefully chosen committees, and all instructed to report at the next meeting.

Yellow-fever was then, as unfortunately it continues to be, the foremost subject of consideration with the sanitary authorities. With a view to more intelligent action in this regard,

early in the session Professor Alexander H. Stevens, of New York, introduced the following resolution :

" *Resolved*, That in the absence of any evidence establishing the conclusion that yellow-fever has ever been conveyed by one person to another, it is the opinion of this Convention that personal quarantine of cases of yellow-fever may be safely abolished."

It was subsequently amended by adding :

" *Provided*, that *fomites* of every kind be rigidly restricted."

The discussion of the subject took up about half the time of the Convention. It was participated in by the following distinguished observers and authorities, in addition to the mover: Drs. John W. Francis, R. La Roche, George B. Wood, W. M. Kemp, C. B. Guthrie, Elisha Harris, J. W. Sterling, E. M. Snow, and several others who had availed themselves of opportunities to become familiar with the disease.

The resolution was submitted to vote, and of 91 delegates voting, 85 voted in the affirmative.

The fourth and last of this series of national sanitary conventions was held in Boston, June 14th–16th, 1860. There were about two hundred delegates present.

It was the most fruitful of any in the number and excellence of the reports and contributions submitted, chiefly as follows :

Quarantine Regulations, as reported from the Committee on External Hygiene ; Registration ; Civic Cleanliness ; Economical Disposition of the Refuse of Cities ; Legal Control of Poisons and Dangerous Drugs ; Utility and Application of Heat as a Disinfectant. Progress was reported on State Medicine, Plans of Tenement Houses, Dispensaries, and Food Supplies. These subjects were continued under revised committees, and several new subjects were added, one being on Permanent Organization, with committees instructed to report at the next meeting.

The report on Quarantine Regulations was thoroughly discussed, and adopted as the sense of the Convention. But the committee was continued, with enlargement, and by resolution it was referred back to the committee with directions to

negotiate with our National Government or Department of State, to secure, by convention or otherwise, the national and international adoption of a code based upon the principles set forth therein.

The reports and discussions on the subjects above mentioned, published in the volume of proceedings of this, the fourth and last National Sanitary and Quarantine Convention, though enunciated forty years ago, still retain their value as foundation elements of preventive medicine.

The War of the Rebellion intervened.

The next step in the progress of national sanitation was the Act of Congress, approved by the President, June 29th, 1870, for the Reorganization of the United States Marine Hospital Service. This service, created nearly three quarters of a century before, with special reference to the care of sick and disabled seamen, appears to have been conducted with scarcely a thought of any means for the prevention of sickness. It was found at this time to be in such an advanced state of decay as to be well-nigh beyond redemption, insomuch that its total extinction was seriously thought of by several distinguished statesmen as a relief to seamen from being any longer taxed for its support.

But, as the result of investigation, the act referred to was passed. It increased the tax on seamen to 40 cents a month, and provided for a Supervising Surgeon, with clearly defined duties regarding all matters connected with the service. The office was filled in April, 1871, by the appointment of John M. Woodworth, M.D.

He had scarcely entered upon the duties of his office, when, on September 12th, 1872, the American Public Health Association was organized. With this Dr. Woodworth identified himself from the outset, and he was among the foremost in the investigation of the local conditions and causes promotive of epidemic diseases generally, in their consistency with the best hygienic conditions for mariners and emigrants.

The American Public Health Association, at its first annual meeting, in Cincinnati, May 1st, 1873,

"*Resolved*, That, in the judgment of this Association, the establishment of a National Sanitary Bureau, with relations to the General Government similar to those of the Bureaus of

Agriculture and Education, is highly desirable as a means of promoting sanitary science and the protection of the public health."

The American Medical Association, at its twenty-fourth annual meeting, May 8th, 1873, adopted the same resolution.

These *texts* are cited in lieu of long quotations of reasons for a national health service, persistently urged by these organizations. Dr. Woodworth was always to be found in the front rank in the prosecution of this purpose. He entered upon a thorough investigation of the local conditions of the epidemic of yellow-fever in 1873, and detailed an officer to make a special investigation and to prepare a succinct history of yellow-fever as it had prevailed from time to time in various parts of the United States. In the following year he issued a circular urging a combination of national and local sanitary effort against the conditions promotive of epidemics; and, in the same year, brought about the adoption of a joint resolution of Congress, securing the co-operation of Surgeon Ely McClellan, of the Army, in an investigation of cholera invasion through the agency of the mercantile marine, with the view of suggesting means of prevention or limitation of future outbreaks. . . .

From a paper by Dr. Woodworth, read before the section on sanitary science at the International Medical Congress, in Philadelphia, 1876, the following conclusions were deduced:

"I. The supervision of ocean travel ought to be directed to securing good sanitary conditions for vessels at all times, out of as well as in port.

* * * * * * * *

"IV. Recognizing the fact that the morbific causes of infectious diseases may sometimes elude the most vigilant sanitary supervision of shipping, the importance of wisely directed internal sanitary measures can scarcely be overestimated."

* * * * * * * *

Dr. Woodworth was the leading spirit in securing the Commission for the Investigation of the Conditions of Yellow-fever in 1878, and a diligent laborer for the establishment of the National Board of Health, as the result of that investigation, by Act of Congress, March 6th, 1879.

He took to his bed on the evening of the day on which the act was passed, and died of disease—as alleged by those who

knew him most intimately—induced by overwork, March 12th, 1879.

Supervising Surgeon-General John B. Hamilton, who succeeded Dr. Woodworth, was opposed to the National Board of Health from the outset, and finally overthrew it. With that contest all readers of THE SANITARIAN are familiar, as they are also with the excellent work of the National Board during the period of its active existence, notwithstanding Dr. Hamilton's opposition. So intense was his opposition to the National Board and its work, that he not only ignored the lines of practical sanitation by which it had so promptly and so signally succeeded in stamping out yellow-fever at Memphis and New Orleans, without restriction upon the liberty of the people—indeed, by promoting their liberty and commerce—by divesting them and their ways of travel of everything likely to convey disease, and by this means raising all the quarantines against them, but, on the first opportunity to exercise his judgment, he also ignored the non-contagiousness of yellow-fever, revived the cordon system of two centuries ago, confined the people to their infected premises, and awaited the change of season, when it might be safe for his agents to make war on fomitic premises. Alas, that this worse than useless procedure did not then and there end.

This practice has passed through several vicissitudes since, all more or less detrimental to the wellbeing of the people immediately concerned, and encouraging to the fallacy that still obtains among the ignorant, that yellow-fever and cholera are contagious diseases, regardless of local conditions.

Divested of this taint, the United States Marine Hospital Service, as at present constituted and equipped, possesses all the elements of an efficient National Health Service.*

The first report under the operation of the law of 1893, recently issued, exhibits the comprehensiveness of the law, and is replete with matter of interest on the varied duties of the medical corps; condition of the hospitals; aid to other branches of the Government service; and, most of all, the initiation of an elaborate public health service.

* Law of February 15, 1893: Annual Report of the Supervising Surgeon-General for the Fiscal Year, 1894.

Summarily, the value of the services of the officers of this corps is shown by an enumeration of their various duties, as follows:

1. The management of hospitals and relief stations for the care of sick and disabled seamen of the merchant marine of the United States, over 50,000 seamen being treated annually.

2. The active management of ten national quarantine stations, including the steam vessels belonging thereto. These national quarantine stations, particularly in the South, are the refuge stations for neighboring local quarantines, and for a large number of years have done the greater part of the actual cleansing and disinfecting of infected vessels. In the last fifteen years their hospitals have, with but few exceptions, received and cared for all the yellow-fever patients taken from vessels entering United States ports.

3. Inspection of local quarantines, under the act of February 15th, 1893.

4. Investigation of reported cases of epidemic disease, including bacteriological examinations and local sanitary conditions.

5. The suppression of epidemic diseases and enforcement of the interstate quarantine regulations.

6. The collection and dissemination of mortality statistics and sanitary information.

7. Scientific investigation into the causes of disease.

8. The examination of pilots for color-blindness.

9. Physical examination of keepers and crews of the life-saving stations; professional examination of their claims on account of disability and their treatment in hospital.

10. Physical examination and treatment of the officers and crews of the Revenue Cutter Service, both prior and subsequent to enlistment, and medical and surgical service under special detail on revenue cutters engaged in Arctic cruising, or on other long voyages.

11. Physical examination of immigrants under the law excluding those afflicted with contagious disease.

12. Service in the office of consuls at foreign ports to assure the accuracy of bills of health given to vessels.

13. Miscellaneous duties imposed from time to time by the Treasury Department.

The following is a summary of the aid given to other branches of the Government service during the fiscal year 1894:

1. *Aid to the Life-Saving Service.*—During the year ended June 30th, 1894, there were 1076 surfmen and keepers examined, of which number 22 were rejected for physical causes; 170 claims for pensions and other benefits provided by the act of

May 4th, 1882, made by keepers and crews of life-saving stations have been passed upon in the office of the Surgeon-General.

2. *Aid to the Inspection Service of Steam Vessels.*—During the year 628 pilots were examined with regard to their ability to distinguish colors and 26 rejected on account of color-blindness.

3. *Aid to the Revenue Cutter Service.*—Five boards composed of medical officers of the Marine Hospital Service have been convened during the year for the physical examination of officers of the Revenue Cutter Service and of candidates for appointment as cadets in that service. There were 220 seamen examined physically as a prerequisite of their enlistment, of which number 21 were rejected. In addition to the above, a medical officer was detailed for duty on the revenue cadet bark *S. P. Chase* on her training cruise to Corunna, Spain, and the Azores.

4. *Aid to the Immigration Service.*—Medical officers of the Marine Hospital Service have been specially detailed for the inspection of immigrants.

*Public Health Service.*—While all the duties performed under the foregoing summary are more or less concerned with the prevention of disease, there are still other and more direct duties to that end, under the obligations of the quarantine laws and inter-State quarantine regulations. Sanitary inspections have been maintained at foreign ports, to prevent the deportation of infectious diseases, and at home ports to prevent their introduction.

A dozen or more quarantine stations have been maintained as means of protection against the introduction of infectious diseases, the disinfection of vessels and merchandise, and the care of the sick. A well-equipped Hygienic Laboratory has been established for the promotion of bacteriological knowledge as a means of diagnosing contagious diseases, and investigating the means of their prevention.

Special reports from the officers in charge of these several duties and stations, with illustrated descriptions of the hospitals, quarantine stations, and disinfecting appliances, greatly add to the interest and value of the report.

Clearly, the United States Marine Hospital Service, however objectionable some of the phases through which it has passed, now possesses the basal qualities of an elaborate and efficient national health service, superior to any new project, departmental or otherwise.

The law needs but little if indeed any amendment to so extend the sanitary service as to include all the advantages suggested by bills that have been introduced in Congress during recent years. And, looked at from a purely sanitary aspect, it is unreasonable to suppose that officers chosen and continued in service, as are the medical corps of the Marine Hospital Service, are not a much better dependence than those would be provided for under proposed measures, subject to changes of administration.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA.—*Mobile*, 31,076: J. A. Abrahams, M.D., Health Officer, reports for January: Deaths, 64—18 under five years of age. Annual death-rate, 24.2.

CALIFORNIA.—J. H. Davison, M.D., President, Los Angeles; J. R. Laine, M.D., Secretary, Sacramento.

The Secretary reports for February from 49 cities, towns, and sanitary districts, aggregating a population of 722,470: Deaths, 910; annual death-rate, 15.00. Deaths from *consumption*, 194; acute lung diseases, 99; *diphtheria* (and croup), 14; *typhoid-fever*, 14.

*San Francisco*, 330,000: Deaths, 483—49 under five years of age. From *typhoid-fever*, 6; *consumption*, 103. Annual death-rate, 15.3.

*Los Angeles*, 100,000: Deaths, 113—26 under five years of age; *consumption*, 19. Annual death-rate, 13.56.

COLORADO.—*Denver*, 150,000: William P. Munn, M.D., Health Commissioner. Deaths in February, 119; from *phthisis*, 31—21 contracted elsewhere. Annual death-rate, 9.52. Contract for removing garbage has been awarded to Mrs. Mary M. Pickerell, she being the lowest bidder.

CONNECTICUT.—Professor William H. Brewer, Ph.D., New Haven, President; Professor C. A. Lindsley, M.D., Secretary, New Haven.

*Monthly Bulletin* reports for February, from *all* the towns in the State, 1094 deaths—27 less than in January, and 57 less than the average in February for the five years preceding.

Death-rate, 15.8 for the large towns; small towns, 16.7, and 16.0 for the whole State. Deaths from *consumption*, 201; *diphtheria* (and croup), 36; *typhoid-fever*, 8.

*Cases* of infectious diseases reported: Measles, 784; scarlet-fever, 99; cerebro-spinal fever, 2; diphtheria and croup, 96; whooping-cough, 58+; typhoid-fever, 27.

DISTRICT OF COLUMBIA, white, 187,600; colored, 87,900: 275,500. W. C. Woodward, M.D., Health Officer, reports for four weeks ending March 7th: Deaths, 451—211 colored people. Death-rate, white, 19.1; colored, 30.3. Deaths from *consumption*, 63.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M.D., State Health Officer, Jacksonville.

At a recent meeting in Jacksonville the Board

*Resolved*, That the President of the Board be instructed to communicate with our Representatives in the United States Congress, calling their attention to the fact that the usefulness of the operations of this Board is threatened by officers of the Marine Hospital Service, under a forced construction of the act of Congress of February 15th, 1893, and request that they use their best efforts with the Secretary of the Treasury in effectually stopping such interference on the part of the Marine Hospital Service.

*Pensacola*, 15,000: Reports for February: Deaths, 15; from consumption, 4. Annual death-rate, 12.

ILLINOIS.—William E. Quine, M.D., President, Chicago; J. W. Scott, Secretary, Springfield.

*Chicago*, 1,600,000: William R. Kerr, Commissioner, reports for February: Deaths, 1988—750 under five years of age. Annual death-rate, 14.85. Deaths from *diphtheria*, 92; *typhoid-fever*, 89; *consumption*, 215; pneumonia, 267.

*Cases* of contagious diseases reported: *Diphtheria*, 315; *scarlet-fever*, 99; *typhoid-fever*, 21.

*Small-pox*. The *Record*, Chicago, March 6th, reports a telegram from Dubuque saying that several cases of small-pox have appeared there and two suspicious cases. Twenty-six cases are now confined in the pesthouse there.

INDIANA.—Douglas C. Ramsey, M.D., President, Mount Vernon; J. N. Hurty, M.D., Secretary, Indianapolis.

After a long-continued deadlock, at a meeting of the State Board at Indianapolis, March 5th, the resignation of Dr. C. N. Metcalf, who had been Secretary of the Board from the time of its organization, was called for, and Professor J. N. Hurty elected instead.

IOWA.—Frederick Becker, M.D., President, Claremont; J. F. Kennedy, M.D., Secretary, Des Moines.

*Bulletin* for March reports for the month of February:

*Diphtheria.*—Linn Grove, Buena Vista County; Grand Junction, Greene County; Rome township, Jones County; Fonda, Pocahontas County; Canton township, Benton County; New Virginia township, Warren County; Jackson township, Winneshiek County; Redfield, Dallas County.

LOUISIANA.—S. R. Oliphant, President, New Orleans; W. R. Harnan, M.D., Secretary, New Orleans.

Mr. Edward S. Maunsell has been appointed by Governor Foster to fill the vacancy in the State Board of Health that has been caused by the death of Dr. Kells.

*New Orleans*, 275,000 (80,000 colored): S. R. Oliphant, M.D., President.

Report for February: Deaths, white, 370; colored, 292. Death-rate per 1000 per annum for the month: Whites, 22.77; colored, 36.80. Deaths from *small-pox* (all colored), 11; consumption, 83—45 colored. March 10th (*Times-Democrat*): There was a very unpleasant "boom" in the small-pox yesterday, 16 new cases being reported, bringing up the total for the last three days to 42, and the number of inmates in the pesthouse to over 130. Nearly all the victims are negroes, who are always the worst sufferers by this disease, as they take no proper steps to protect themselves against it, and refuse to go to the trouble of being vaccinated. March 14th (*ibid.*): Mayor Fitzpatrick, after a conference with the Board of Health, assured the health officials that the Council would do its share in helping to stop the progress of the disease. Another encouraging sign is the fact that the people have become aroused to the necessity of getting vaccinated.

MAINE.—C. D. Smith, M.D., President, Portland; A. G. Young, M.D., Secretary, Augusta.

*Registration Report for* 1893.—Population (1890), 661,086—12,150 increase in the decade 1880–90. *Births*, 13,908; birth-rate, 21.04 per 1000. *Marriages*, 5795; marriage-rate, 8.76 per 1000. *Divorces*, 627—10.82 per cent of the marriages. *Deaths*, 11,134; death-rate, 16.84 per 1000; 1736, or 15.56 per cent of the deaths, were of infants under one year of age; 714, or 6.42 per cent, were of infants from one to five years of age.

The chief causes of death, named in the order of their greater prevalence, excepting 696 still-born, were: *Consumption*, 1299—19.64 per 10,000 population; *zymotic diseases*, 1237—18.71 per 10,000 (deaths from zymotic diseases respectively: Diarrhœal diseases, 642; typhoid-fever, 257; diphtheria and croup, 152; scarlet-fever, 80; measles, 55; whooping-cough, 51); pneumonia, 1143; heart diseases (unspecified), 663; old age (over sixty-five), 642; apoplexy, 422; paralysis, 326; inflammation of brain and membranes, 263; heart failure, 253; bright's disease, 217; bronchitis, 197; peritonitis, 151; valvular diseases of heart, 119; debility, 118; dropsy, 115; convulsions, 108; gastritis, 107.

MASSACHUSETTS.—H. P. Walcott, M.D., Chairman, Cambridge; S. W. Abbott, M.D., Secretary, Boston.

*Boston*, 501,083: S. H. Durgin, M.D., Chairman. Deaths in January: 921—238 under five years of age. Annual death-rate, 22.05 per 1000. From *diphtheria* (and croup), 54; *typhoid-fever*, 14; *consumption*, 108. Cases of contagious diseases reported for the month: Diphtheria, 501; measles, 31; scarlatina, 136; typhoid-fever, 58.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M.D., Secretary, Lansing.

The Secretary reports for February: Compared with the preceding month, pneumonia increased and scarlet-fever and remittent-fever decreased in area of prevalence.

Compared with the average for corresponding months in the ten years 1886–95, typhoid-fever was more prevalent, and intermittent-fever, consumption, diarrhœa, remittent-fever, pneumonia, and erysipelas were less prevalent in February, 1896.

Including reports by regular observers and others, *consumption* was reported present in Michigan in the month of February, 1896, at 254 places; *scarlet-fever* at 66 places; *diphtheria* at 51 places; *typhoid-fever* at 45 places; *measles* at 30 places; *whooping-cough* at 28 places, and *small-pox* at 5 places.

Reports from all sources show *consumption* reported at 10 places more; *scarlet-fever* at 8 places less; *diphtheria* at 28 places less; *typhoid-fever* at 45 places less; *measles* at 2 places less; *whooping-cough* at 18 places less, and *small-pox* at 4 places more in the month of February, 1896, than in the preceding month.

*Detroit*, 250,000: Samuel P. Duffield, M.D., Health Officer.

Thomas Matthews, Registrar of Vital Statistics, reports for February: Deaths, 347—51 under five years; from *consumption*, 19; *typhoid-fever*, 5; *diphtheria* (and croup), 4; *small-pox*, 3. Death-rate, 14.05.

MINNESOTA.—Franklin Staples, M.D., President, Winona; C. N. Hewitt, M.D., Secretary, Red Wing.

*Minneapolis*, 225,602: H. N. Avery, M.D., Health Commissioner, reports for February: Deaths, 162—53 under five years of age. Deaths from *diphtheria* (and croup), 10; *consumption*, 20. Death-rate, 10.64.

Summary of report for the year 1895: Deaths, 2057; from *consumption*, 234; pneumonia, 158; diphtheria, 114; *cholera infantum*, 106; *typhoid-fever*, 88. Annual death-rate, 9.11.

*St. Paul*, 140,292: Alexander J. Stone, M.D., Commissioner, reports for February: Deaths, 120—40 under five years of age. Annual death-rate per 1000 was 10.26. Deaths from *diphtheria* (and croup), 9; *typhoid-fever*, 6; *consumption*, 16.

*Duluth* (Chicago *Inter-Occan*, March 8th): Suit has been brought against William Craig, formerly Superintendent of the Duluth Gas and Water Company, and he will have to stand trial for manslaughter in the second degree for furnishing impure and disease-breeding water to Harry W. Smith, thus causing his death. Judge Moer to-day decided that the indictment was good, and overruled Craig's demurrer. He held that if Craig knowingly furnished impure water, thus

causing typhoid-fever, he could be held for manslaughter in the second degree, but admitted that this was a difficult thing to prove.

MISSISSIPPI.—(*Picayune*) New Orleans, February 29th: A bill has been introduced in the Legislature to create the Mississippi Department of Public Health, to specify its duties and powers, to provide for the collection and publication of vital and medical statistics in the State, and to promote public health interests generally.

MISSOURI.—F. J. Lutz, M.D., President, St. Louis; Willis P. King, M.D., Secretary, St. Louis.

*St. Louis*, 570,000: M. C. Starkloff, M.D., Commissioner of Health, reports for February: Deaths, 780—254 under five years of age; from *diphtheria* (and croup), 44; *phthisis*, 101. Annual death-rate per 1000, 16.04.

NEW JERSEY.—C. F. Brackett, M.D., President, Princeton; Henry Mitchell, M.D., Secretary, Asbury Park.

*State Board Laboratory.*—Trenton, March 4th: The State Board of Health has formally opened the new bacteriological laboratory to the public. The laboratory is built on the grounds of Princeton College, the building having been completed about a week ago.

*Hudson County—Jersey City* and vicinity, 338,671: Report for February: Deaths, 629—269 under five years of age; from *diphtheria* (and croup), 43; from *typhoid-fever*, 35; from *consumption*, 49; bronchitis, 43; pneumonia, 118. Annual death-rate per 1000, 26.7.

For the year 1895, 320,080: Deaths, 6285; under five years, 2622; from *diphtheria*, 175; typhoid-fever, 149; phthisis, 683; pneumonia, 723; bronchitis, 248. Annual death-rate, 22.9.

*Newark*, 215,725: Health Officer Lehlbach reports for the four weeks ending March 14th: Deaths, 394—138 under five years of age; from *diphtheria*, 16; *consumption*, 56. Annual death-rate, 23.69.

*Paterson*, 97,344: J. I. Leal, M.D., Health Officer, reports for February: Deaths, 157—56 under five years of age; from *diphtheria* (and croup), 13; *consumption*, 23.

For the fiscal year ending March 20th, 1895, 95,263: Deaths, 1925—423 under five years; from *diphtheria* (and croup), 164; *typhoid-fever*, 28; *diarrhœal diseases*, 196; *consumption*, 223. Annual death-rate, 20.2.

*Hoboken*, 55,000: *Infectious* diseases continue prevalent. Health Warden Arlitz reports for February (Jersey City *Journal*, March 13th): Cases of contagious diseases, 75; *diphtheria* (and croup), 39; *scarlet-fever*, 30; *measles*, 5. Deaths from all causes, 83. Death-rate, 22.55.

*Bayonne* (19,856) is also well-nigh overwhelmed with preventable diseases. Report for February (Jersey City *Journal*, March 12th), 54 cases—*diphtheria* (and croup), 30; *typhoid-fever*, *measles*, and *scarlet-fever*, of each 8.

NEW YORK.—Daniel Lewis, M.D., President, Syracuse; B. T. Smelzer, M.D., Secretary, Albany.

*Bulletin* reports for January: Deaths, 10,176, and an estimated death-rate of 18.50. Compared with the preceding month the relative infant and zymotic mortality was the same; there was an increase in mortality from scarlet-fever, measles, and cerebro-spinal meningitis, and a small decrease from typhoid-fever and diphtheria. Compared with January, 1895, there were considerably more deaths from scarlet-fever, measles, and typhoid-fever. The increased mortality is over all parts of the State; that from scarlet-fever, measles, and cerebro-spinal meningitis being limited to the Maritime District, the decrease in typhoid-fever and diphtheria being general. Scarlet-fever was reported from 46 localities against 43 in December; diphtheria was reported from 32 localities, the same as in December; typhoid-fever, from 22 localities, against 34 in December. One death occurred from small-pox in Brooklyn. *Consumption* caused 100 more deaths that in December, but 100 fewer than in January of last year. Acute respiratory diseases caused 2000 deaths, an increase of 250 over December, but 570 less than in January, 1895, and less than in this month for five years. There were 687 reported deaths from diseases of the urinary system, which is an unusual number. The large increase in mortality which for several years has been reported in January over December, due to *grippe*, has not occurred, and the usual annual recurrence of *grippe* which

appears to have set in during December has been far milder than any of the series, not more than 500 deaths being attributable to it this month. There has been a remarkable epidemic of jaundice in the Hudson Valley District, and the reports of death from jaundice elsewhere in the State indicate its probable more widespread distribution. The average mean temperature for the month was 4° below the normal, with wind more northerly than usual, of moderate average velocity, and a deficiency in the precipitation (rain or snow fall).

*New York City*, 1,995,000: Deaths, 3657—1406 under five years. Death-rate, 21.60. Zymotic diseases, per 1000 from all causes, 142.80; *diphtheria* (and croup), 208; *typhoid-fever*, 20; *consumption*, 460. Deaths from *diphtheria* (and croup) during the four weeks ending March 14th, 166; *measles*, 88; *consumption*, 408; *pneumonia*, 624. Death-rate, 23.7.

*Brooklyn*, 1,100,000: Deaths, 1930—692 under five years. Death-rate, 20.55. From zymotic diseases per 1000 from all causes, 135.80; *diphtheria* (and croup), 168; *typhoid fever*, 20; *consumption*, 190. Deaths from *diphtheria* (and croup) during the four weeks ending March 14th, 103; *measles*, 55; *consumption*, 165; *pneumonia*, 340. Death-rate, 21.

*Births.*—The Department of Health has issued a circular to physicians and midwives urging attention to the health *ordinance* requiring reports of all births *within five days after birth.*

*Buffalo*, 335,709: Deaths, 327—98 under five years. Death-rate, 12.0. From zymotic diseases per 1000 deaths from all causes, 171.25; *diphtheria* (and croup), 36; *typhoid-fever*, 5; *consumption*, 38.

*Rochester*, 160,000: Deaths, 186—39 under five years. Death-rate, 14.00. From zymotic diseases per 1000 deaths from all causes, 113; *diphtheria* (and croup), 9; *typhoid-fever*, 3; *consumption*, 32.

*Albany*, 100,000: Deaths, 207—59 under five years. Death-rate, 24.50. From zymotic diseases per 1000 deaths from all causes, 240; *typhoid-fever*, 25!

Trojans, says the *Register* of Hudson, March 13th, are quoting from the State Board of Health statistics to show that Albany is the unhealthiest city in the State; but they don't make so prominent the fact that Troy's population is only placed at 65,000, while the Capital City shows 100,000. The

fact that Albanians are daily consuming large quantities of Troy's sewage with their drinking water may account for the higher rate in the ancient burg. At the same time, Trojans are not to be held responsible for the peculiar tastes of the Albanians. If they like diluted Troy sewage they're perfectly welcome to it.

*Elmira's* epidemic of *typhoid-fever* is under investigation by the State Board of Health. There seems to be no question but that the *polluters* of the water supply are the guilty parties, but whether they will be found out and punished is quite another question. Evidently, with the example of Albany before them, the people of Elmira should not try to get used to such water as the Albanians have been trying to for upward of twenty years.

Dr. F. C. Curtis, in a report to the Albany Board of Health, March 2d, states that

"The records of the past twelve years, which are accessible and accurate, show that during that period 924 deaths have occurred from typhoid-fever; that in no one year have there been fewer than 50 deaths. The maximum mortality of 162 occurred in 1895."

Yet there are some places in *Watertown* where the people have been testing potations of sewage during the last year with the usual effects, loudly protesting against the recent action of the State Board of Health to cut off the supply of sewage as an interference with their liberty!

*The Syracuse Garbage Muddle* is not yet ended, according to latest accounts (Syracuse *Herald*, March 10th). It appears that *after* the Board of Health had signed the contracts with Dailey & Aldrich, the Mayor visited Philadelphia to inspect their process. He learned that the crematory rendered the neighborhood well-nigh uninhabitable, and that it was inadequate to the claims made for it in the matter of garbage disposition. What effect the facts as to the Philadelphia crematory as learned by the Mayor may have upon the validity of the Dailey & Aldrich contract with the Board of Health is for the lawyers to decide.

The infusion of some new blood into the Board of Health is having good effect. The Board has been running haphazard for about a year, the members contending against each other's

preferences for garbage disposal, and the public health left to shirk for itself. But the recently elected new members have devised new rules that will oblige physicians to report at once all cases of contagious diseases coming to their notice, and to thereafter report twice a week as to the condition of the patients and the quarantine.

NORTH CAROLINA.—George G. Thomas, M.D., President, Salem; Richard H. Lewis, M.D., Secretary, Raleigh.

February *Bulletin* summarizes the reports of 80 counties for January. The principal diseases, named in the order of their greater prevalence were measles, pneumonia, typhoid-fever, influenza, bronchitis, whooping-cough, and scarlatina. The mortuary statistics for the month, of an aggregate population of 26 towns, 76,317 white and 53,617 colored. Deaths, respectively, 88 and 84, and death-rates, 13.9 and 18.8. The chief causes of death were, consumption, 36; pneumonia, 29; heart diseases, 20; other diseases, 1 to 6.

NORTH DAKOTA.—The State Board of Health met at Fargo, March 4th (*Argus*, March 5th), and

*Resolved*, That no sewerage, drainage, or refuse or polluting matter of such kind as either by itself or in connection with other matter will corrupt or impair the quality of the water of any spring, well, pond, lake, stream, or river for domestic use, or render it injurious to health; and no human or animal excrement shall be placed in or deposited into or placed on the ice of any pond, lake, or spring used as a source of water supply by any town, village, or city, nor shall any such sewerage, drainage, refuse or polluting matter or excrement be placed upon the banks of any such pond, lake, stream, well, spring, or river above the point where such supply is taken or into any feeders or banks thereof, of any pond, lake, stream, well, spring, or river.

OHIO.—Byron Stanton, M.D., President, Cincinnati; C. O. Probst, M.D., Secretary, Columbus.

*Cincinnati*, 350,000: J. W. Prendergast, M.D., Health Officer, reports for February: Deaths, 577—179 under five years of age. Death-rate, 19.78 per 1000. From *diphtheria* (and croup), 13; *typhoid-fever*, 22; *consumption*, 70; pneumonia, 66.

*Cleveland*, 330,279: J. L. Hess, M.D., Health Officer, reports for Februaiy: Deaths, 341—127 under five years; from *diphtheria* (and croup), 19; *typhoid-fever*, 20; *consumption*, 30; pneumonia, 25. Death-rate, 13.

*Toledo*, 120,000: J. T. Woods, M.D., Health Officer, reports for February: Deaths, 108—4 under five years; from *diphtheria* (and croup), 5; *typhoid-fever*, 3; *consumption*, 8; pneumonia, 6.

*Small-pox* has broken out, March 1st, in the *Dayton* workhouse, and been the cause of a panic, there being upward of 100 inmates besides employés. Dayton has no pesthouse, and the public authorities are at their wits' end to know how to dispose of the prisoners.

PENNSYLVANIA.—S. T. Davis, M.D., President, Lancaster; Benjamin Lee, M.D., Secretary, Philadelphia.

*Philadelphia*, 1,188,793: Theodore B. Stulb, Health Officer, reports for four weeks ending February 29th: Deaths, 1922—648 under five years of age. Death-rate, 21.22. Deaths from *diphtheria* (and croup), 113; *typhoid fever*, 23; *cousumption*, .202; pneumonia, 318.

*Pittsburgh*, 275,000: Report for four weeks ending February 29th: Deaths, 444—169 under five years of age; *typhoid-fever*, 22; *consumption*, 46; pneumonia, 56. Death-rate, 20.73.

*Small-pox* is reported (Scranton *Truth*, March 3d) in Priceburg.

RHODE ISLAND.—*Bulletin* for December reports for November: Deaths, 564; from *diphtheria*, 60; *consumption*, 55—11.5 per cent of all deaths.

*Newport.*—The permanent population of Newport, according to the census of 1895, is 21,500 inhabitants. Deaths in 1895, 349. Death-rate, 16.2. Deaths from *consumption*, 44; bronchitis, 13; pneumonia, 8; *typhoid-fever*, 8; *diphtheria*, 5.

SOUTH CAROLINA.—J. R. Bratton, M.D., Chairman, Yorkville; H. D. Fraser, M.D., Secretary, Charleston.

*Charleston*, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M.D., Health Officer, reports for five weeks ending

February 29th : Deaths, 134—99 colored. Under five years, 45 ; deaths from consumption, 19. Annual death-rates, white, 15.67 ; colored, 35.45.

TENNESSEE.—J. D. Plunkett, M.D., President, Nashville ; J. Berrien Lindsley, M.D., Secretary, Nashville.

*Bulletin* for February 20th reports that the principal diseases, named in the order of their greater prevalence in the State, for the month of January were : Lung diseases acute, *la grippe*, measles, whooping-cough, consumption, typhoid-fever, scarlet-fever, malarial-fever, mumps, diphtheria, and small-pox.

*Small-pox.*—Two cases in Obion County—1 white, 1 colored, January 25th. On the same date a case of a colored man was reported in Fayette County. In Shelby County there occurred 35 cases—1 white and 34 colored ; in *Memphis*, 21 cases—3 white and 18 colored, making a total of 59 cases in all for the State.

*Memphis*, 55,923—white, 28,064 ; colored, 27,859 : J. J. McGowan, M.D., Secretary of the Board of Health, reports for the year 1895 : Deaths, white, 695 ; colored, 773. Death-rates respectively, 24.80, 27.75 : 26.27. Chief causes : *Consumption*, 209—127 colored ; *fevers*, malarial and typhoid, 132—90 colored ; *diphtheria*, 20—4 colored ; heart diseases, 75—38 colored ; pneumonia, 125—80 colored ; *dysentery*, 65—43 colored. Cases of contagious diseases reported : *Small-pox*, 72—67 colored ; *scarlet-fever*, 62—3 colored ; *diphtheria*, 41—4 colored.

UTAH.—*Salt Lake City*, 48,076 : William T. Dalby, M.D., Commissioner, reports for February : Deaths, 33—2 under five years of age ; from pneumonia, 6 ; old age, 4 ; rheumatism, 3 ; from 20 other causes, 1 each. *Death-rate*, 5.65. Verily Salt Lake City takes the cake for healthfulness.

WISCONSIN.—Solon Marks, M.D., President, Milwaukee ; U. O. B. Wingate, M.D., Secretary, Milwaukee.

*Milwaukee*, 255,000 : Walter Kempster, M.D., Commissioner, reports for February : Deaths, 307—113 under five years of age. Annual death-rate, 14.44 per 1000. Deaths

from *diphtheria* (and croup), 29; *typhoid-fever*, 11; *consumption*, 39; pneumonia, 39.

COMMISSION FOR THE STUDY OF YELLOW-FEVER.—The *Boletin de Medicina Naval y del Cuerpo de Sanidad de la Armada*, of Madrid, for February, announces that steps have been taken by Señor Fernandez Losada, now at the head of the Sanitary Department of the army in Cuba, for the appointment of a commission to consist of a surgeon from the army and another from the navy, who shall have associated with them two professors from the bacteriological laboratory of Havana, which is under the direction of the eminent scientist Santos Fernandez, to make a complete and *scientific* study of yellow-fever.

Moreover, the Spanish Minister of War has ordered that from September 1st the Academy of Medical Hygiene shall be established in Madrid, and will form a most important centre for the dissemination of scientific training in special branches. Sixteen places will be devoted to medical students.

To be eligible to a place in the Academy, the applicant must have the title of Doctor or Licentiate of Medicine and Surgery. Those who will be received as alumni will study during eight months, directing their attention to such subjects as will familiarize them with the medical needs of the army.

FILTHY BAKESHOPS.—One of the most important bills before the Legislature of New York is, in substance, as follows:

"All buildings or rooms occupied as bakeries shall be properly drained and plumbed, and constructed with air shafts, windows, or ventilating pipes sufficient to insure ventilation. No cellar or basement not now used as a bakery shall hereafter be used as a bakery. Every room used for the manufacture of food shall be at least eight feet in height, and shall have an impermeable floor of cement or of tiles. No domestic animals, except cats, shall be allowed to remain in a room used as a bakery, or for the storage of flour or meal food products. Sleeping places for the persons employed in a bakery shall be kept separate from the rooms where food products are manufactured."

Recent investigation of the bakeshops of New York and Brooklyn discovered them to be filthy in the extreme. Many

of the employés were diseased, while dogs, rats, and dirty children made the dough vats their playground.

THE PASSAIC RIVER.—The New Jersey Legislature has passed a bill to prohibit the pollution of the Passaic with sewage by Paterson and other towns above Newark and Jersey City.

THE VITAL STATISTICS OF EGYPT, as recently published by the *Lancet*, are full of matter for reflection. In the first place, the rate of increase can be paralleled in no European country at any period since records have been kept. It represented 1.79 per cent in the year 1894!—births reaching nearly 42 per 1000, while deaths only reached 24 per 1000. If there be any fraud in the return, it must go to diminish the asserted increase, not to enlarge it, for the motive would be to evade conscription. A death-rate of only 24 per 1000 in a country which ignores sanitation is startling; but the wonder grows immeasurably when we observe that in Alexandria and Cairo, where laws of health are enforced as strictly as may be, deaths represent 86 per cent of births, while in the rural districts they are but 54 per cent. It is the consequences, however, which interest us. In 1894 the population of Egypt below the Second Cataract was estimated at 8,000,000; the census of 1882 showed 6,469,710. A rise of 1,500,000 in twelve years! Authorities have hesitated hitherto to credit the population of 12,000,000, in the time of Rameses II., which Champollin and the French savants made out upon such evidence as they could find. But these extraordinary returns make it quite probable. The land under cultivation then was vastly more extensive than now. But the encroachment of the desert can be repelled, if an irrigation system equal to that of old be once more established. Egypt, therefore, has a boundless expansion. But if the people multiply at such a rate under the pax Britannic, so they must in varying degrees elsewhere, and not in all our colonies is there surplus land for them to occupy. But meanwhile the birth-rate of Europe steadily lowers. Any one can draw conclusions.

# OBITUARY.

DR. JOSEPH JONES died at his residence in New Orleans, February 17th, 1896. His health had been gradually failing for the past six or eight months, and the end came quietly when his vital energies had completely spent themselves.

Dr. Jones was born in Liberty County, Ga., September 6th, 1833 His father was the Rev. Charles Colcock Jones, D.D., a distinguished Presbyterian divine, eloquent in the pulpit, eminent as a theological instructor, and author of "A History of the Church of God;" his maternal grandfather, Captain Joseph Jones, of the Liberty Independent Troop, who served in the War of 1812; his great-grandfather on the paternal side, Major John Jones, an officer in the Continental Army, who, as aide-de-camp to Brigadier-General Lachlan McIntosh, fell before the British lines around Savannah during the memorable assault in October, 1779, and himself connected with the Pinckneys, Haynes, Swintons, and Lageres of the Palmetto State, his ancestors in the male line having removed from England to Charleston, S. C., nearly two centuries ago.

Dr. Jones's early education was in the main acquired through the aid of private tutors at the paternal homes, Montevideo and Maybank plantations, in Liberty County, Ga. In 1849, when he was fifteen years of age, he repaired to South Carolina College at Columbia. Having completed his Freshman studies in this institution, he matriculated at Nassau Hall, Princeton, N. J., in the Sophomore Class of 1850. There three years were profitably spent. Selecting the healing art as his profession, Dr. Jones subsequently entered the medical department of the University of Pennsylvania, where he addressed himself with all diligence to a preparation for his lifework. Shortly after the award of his doctorate, in 1855, he was elected Professor of Chemistry in the Medical College of Savannah, Ga., and since then he has, under various auspices, filled the position of medical instructor to the time of his death. In 1858 he became a professor of physics and geology in the State University of Athens, and the year after was called to the chair of chemistry in the Medical College of

Georgia, at Augusta. This office he retained during the period covered by the late war, faithfully and energetically performing the duties incident to it, except when interrupted by active engagement in the fields. In 1866 he was tendered the professorship of institutes of medicine in the University of Nashville. Responding to the call, he repaired to the city, and only terminated his labors there when he removed to New Orleans in the fall of 1868. It was then that his distinguished labors in the University of Louisiana, now Tulane University, began. He remained actively associated in the position of Professor of Chemistry, in which he was then installed. Dr. Jones's appointment as Visiting Physician at the Charity Hospital of New Orleans was likewise contemporaneous with his arrival in this metropolis.

His long and valuable ministrations in the capacity have proven beneficial alike to the State of Louisiana and the cause of natural science. He was the chemist of the Cotton Planters' Convention of 1860, and the compiler and author of the first report submitted by that body touching the agricultural resources of the State. When the Southern Historical Society was founded in New Orleans in May, 1869, he became the first secretary of that organization. To his efforts the sustentation of its vitality in the infant state of its history is to a large extent due. The organization was subsequently, about 1873, transferred to Richmond, Va., its present place of abode.

In 1880 Professor Jones was appointed President of the State Board of Health of Louisiana. He established an elaborate system of quarantine, which, notwithstanding the prevalence of yellow-fever in South American ports, kept it from New Orleans, and added to the evidence that yellow-fever was not indigenous to New Orleans and the Mississippi, and that it could be excluded from New Orleans by means of a vigorous local sanitation and effective quarantine. After a continuous battle of four years against the vast maritime interests of the port, Dr. Jones, in behalf of the Board of Health of Louisiana, achieved a signal victory in a decision from the Supreme Court of Louisiana, which enabled him to enforce his quarantine measures. An appeal was taken to the United States Supreme Court by the Morgan Louisiana and Texas Steamship Company, but Dr. Jones's decision in the Supreme

Court of Louisiana was sustained, justifying the State in the imposition of a tax on commerce for the support of her quarantine establishment.

In 1887 Dr. Jones was elected President of the State Medical Society. Dr. Jones was commissioned full surgeon in the Confederate Army in 1862, and his services terminated only with the cessation of hostilities in 1865. He was a member of the leading medical and scientific societies in both this country and Europe. His chief claims to distinguished recognition rest upon his achievements in the field of original investigation, and upon his reputation as an authoritative and exhaustive writer. He is the author of a number of valuable contributions to medicine.

Dr. Jones was twice married, his first wife being Miss Caroline Davis, of Augusta, Ga., by whom he had four children, and his second wife being Miss Susan Raynor Polk, a daughter of the Right Rev. Leonidas Polk, of Louisiana, and Lieutenant-General in the armies of the Southern Confederacy.

## NEW BOOKS AND BOOK REVIEWS.

PHYSICIANS AND SURGEONS OF AMERICA. (Illustrated.) A Collection of Biographical Sketches of the Regular Medical Profession. Edited and compiled by IRVING A. WATSON, A.M., M.D., Secretary American Public Health Association; Permanent Member American Medical Association; Honorary Member Academia Nacional de Medicina de Mexico; Assistant Secretary-General First Pan-American Medical Congress; Member Société Française D'Hygiène of Paris; Member of Medico-Legal Society of New York; Member New Hampshire Medical Society; Central District Medical Society; Member and Secretary State Board of Health of New Hampshire; Member and Secretary of State Board of Commissioners of Lunacy; State Registrar of Vital Statistics; President State Board Cattle Commissioners; ex-Medical Director New Hampshire National Guard; ex-Vice-President National Conference of State Boards of Health, etc. Concord, N. H.; Republican Press Association.

A magnificent quarto volume of eight hundred and forty-three pages, elegantly printed on paper of the best quality,

and wellnigh every page embellished with a photo-engraved portrait of one or of more than one of the eleven hundred and fifty living physicians and surgeons distinguished by their deeds, of which this volume is a concise record.

The editor's membership of an unusually large number of professional organizations, and his consequent extensive acquaintance with physicians, have been turned to admirable account in the production of this volume, and it will doubtless be esteemed by the medical profession generally as a valuable epitome of the status of medicine in America during the last quarter of the nineteenth century.

ESSAYS ON RURAL HYGIENE. By GEORGE VIVIAN POORE, M.D., F.R.C.P. Second Edition. Illustrated. 12mo, pp. 382. London and New York: Longmans, Green & Co.

The author of this book has long been known as one of the progressive sanitarians of London, who by lectures and otherwise has not been backward in giving the public the benefit of his observations and investigations, of which this volume is the substance. Not, indeed, by any means confining his observations, investigations, and practical conclusions to the head centre of sanitary progress—England—where presumably there is so much less to be seen that is in conflict with efficient sanitary measures than elsewhere, but to conditions unfortunately abundant everywhere, and more or less amenable to the practical suggestions of these essays and lectures. Very ultra, however, is Dr. Poore in some things. For the rural house he would dispense entirely with the sanitary engineer. He would have no self-cleansing sewer that always is choked, nor traps that never work, nor anything with a patent in it, much less a plumber. All waste pipes are filthy. All water-closets are abominations. He would use dirt closets. He is a firm believer in the revivifying power of Mother Earth. To each country house there must be grounds. It is there, just below the surface of the ground, that the solid excreta from the house must be buried. The slops are to be carried to the grounds by means of open gutters. The garbage is to be converted into manure. If there is malaria—what then? Well, there should not be any; and Dr. Poore is inclined to believe that if there is malaria it is one's own fault.

The chapter on Water is a gem. Drinking water should be protected from all impurity, and then there is no room for the everlasting discussion about purification methods, electrical or otherwise. The author shows by illustration how stupendous is the problem to be solved by citing that of the London City Council. Any scheme presented for their consideration must be calculated on a minimum supply of 35 gallons per head per diem for a population of 12,500,000. That means 437,500 gallons every twenty-four hours, and 160,000,000,000 gallons per annum. Where or how is it to get it? How will New York manage in half a century from to-day? Thirty-five gallons per head is not very much water. In New York and Brooklyn we want much more than twice this. Questions of supply of water have to do with rainfall, condition of soil, and average climate—and so the solution of this subject of pure water for a great city is always difficult.

The chapter on Air is just as good; it should be *kept* pure.

And of all the rest: The House; Practical Details; Personal Experiences in Country Towns, and the story of Bremontier, so apt in its illustration of practical means in redemption of malarial regions into healthful and fruitful gardens. All country people who would acquire knowledge of conditions detrimental to health in their surroundings and how to overcome them should read this book.

ELECTRICITY IN ELECTRO-THERAPEUTICS. By EDWIN J. HOUSTON, Ph.D., and A. E. KENNELLY, Sc.D. 12mo, pp. 412, 128 illustrations. Price, $1. The W. J. Johnson Company, 253 Broadway, New York.

This book is by two eminently practical men, who have been long engaged in the field of electro-therapeutics: Professor Houston, as President of the American Institute of Electrical Engineers, and lecturer on electro-therapeutics; Mr. Kennelly is widely known from his connection with the practical application of electrical science, having been for many years the principal assistant of Thomas A. Edison. It treats of electricity and magnetism from the most modern standpoint, in language so simple that no special training in these sciences is required to understand it. All mathematics, except simple arithmetic, have been excluded.

The various subjects are treated both from the theoretical and the practical side ; on the former, the correlation of electric and magnetic forces is considered, as well as the principles and basis of operation of the various forms of apparatus employed ; while on the latter, the construction and adjustment of this apparatus are fully illustrated and described. These comprise Voltaic Cells of various kinds, Influence and Static Machines, Induction Coils, both of the Faradic and Teslaic type, Dynamos, Alternators, Transformers, Motors, Cauteries, Incandescent Lamps, etc.

The profuse illustration of the book greatly aids in the ready comprehension of the subject treated.

REPORT OF THE COMMISSIONER OF EDUCATION, 1892–93. 2 vols., pp. 2153. Washington : Government Printing Office.

To adequately review this report of the most important interests of the nation is beyond the scope of THE SANITARIAN. Briefly, by abstract :

The whole number of pupils enrolled in the schools of all kinds—exclusive of special schools, conservatory, art, trade, etc.—during the school year 1892–93 was 15,083,630 ; 96.2 per cent of the whole were in the elementary grades ; 2.7 per cent only were men under secondary instruction in public high schools, private academies, preparatory schools, and corresponding institutions. Only 1 pupil in 37 was of the secondary grade, and 1 in 94 under higher instruction. The whole enrolment in the common schools during the year was 13,510,719 ; of these, 8,855,717 in attendance daily. The number of teachers employed was 383,010, of whom 260,954 were women.

Of the 451 universities and colleges enumerated, 310 are co-educational. The total number of instructors reported by the 451 institutions was 10,247. Students : preparatory, 44,054 ; collegiate, 55,553 ; residential graduates, 2625 ; non-residential graduates, 940 ; professional, 19,385 ; total, 140,053.

Among the important events of the year were the affiliation of the Teachers' College, New York City, with Columbia College, the establishment of a school of pure science by the latter, and the opening to a limited extent of Brown and Yale universities to women.

Of *illiteracy:* In 1870 the per cent of illiterates to the total population ten years of age and over was 20; in 1880, 17; in 1890, 13.3. Of the native white population: 1870, 10.8; 1880, 8.7; 1890, 6.2. Of the foreign born: 1870, 14.4; 1880, 12; 1890, 13.1. Of the colored population: 1870, 79.9; 1880, 70; 1890, 56.8. A survey of the educational systems in foreign countries follows. Much space is devoted to the reports called forth by the Columbian Exposition, relating to education in all its phases.

Sanitation was illustrated by the Philadelphia Workingmen's Home in Midway Plaisance, with regard to sanitary living, by the exhibition of a two-story and basement house, as a specimen of 150,000 precisely similar homes in Philadelphia. The exhibitors claimed that it was by the use of such houses that the people of Philadelphia were so much more comfortably housed in Philadelphia than in New York or Chicago. With just as many people as Chicago, Philadelphia had half as many more houses; and whereas, in Philadelphia, seven families out of every eight lived in separate houses, in New York the proportion was only one family in six.

THE TWELFTH ANNUAL REPORT OF THE BUREAU OF STATISTICS OF LABOR OF THE STATE OF NEW YORK FOR 1894, a volume of 670 pages, treats chiefly of labor organizations, and whether or no labor has been benefited by reason of such organization, and in what respect. The whole number of members reported by 691 organizations is 155,843. A full and detailed report follows, which shows that the out-of-work benefits expended by 474 organizations, with a total membership of 121,957, amounted to $106,801.69; and $415,015.90, for sick, death, and strike benefits. Inquiry by the Bureau reveals the fact that the condition of many of the bakeshops of the State is deplorable, and many of them unfit as workshops for human beings to work in, and absolutely unfit as places to produce bread, cake, or other food. The following was reported by a Brooklyn "Bakers' Union":

"The condition of the bakeshops of the city of Brooklyn is in a miserable state, as they are all underground and have no methods of ventilation." The report treats extensively on the labor disputes in the State for the nine years 1885–93,

comprehending an account of the strikes and their results. It consists in large measure of tabulated statistics, of the relations of employers and employés, hours of labor, evidence in strike investigations, etc.; and appends the proceedings of the Tenth Annual Convention of the National Association of Officials of Bureaus of Labor Statistics in the United States, held at Washington, D. C., May, 1894.

CHOLERA IN CALCUTTA IN 1894, AND ANTI-CHOLERA INOCULATION. Report to the Government of India. By W. H. HAFFKINE. Calcutta: Thacker, Spink & Co.

Two large pamphlets, giving a historical sketch of the cholera in Calcutta in 1894, and, to some extent, of its outputs; and of Professor Haffkine's anti-choleraic inoculation, based upon Koch's discovery of the *comma bacillus*.

The reports comprehend a list of the places visited by Haffkine, the number of persons in round numbers that he inoculated, and the results as far as ascertainable in 1894. The Report to the Government in India, August 25th, 1895, summarizes his practice from April, 1893, to that time, giving the observed results of first and second inoculations at several places in India, and his conclusions. In the course of the first year 22,703 people were inoculated in the Northwest Provinces and Oudh and in the Punjab. From March, 1894, to July, 1895, 19,473 individuals were inoculated in some of the most affected localities of India.

The results summarized seem to indicate that this practice holds about the same relation to cholera as the antitoxin serum in vogue holds to diphtheria.

ANNUAL REPORT OF F. MONTIZAMBERT, M.D., F.R.C.S., ETC., GENERAL SUPERINTENDENT OF CANADIAN QUARANTINE, FOR THE YEAR ENDING OCTOBER 31ST, 1895, gives a concise sketch of the prevalence of quarantinable diseases abroad, and of the means used for its prevention during the period; and of the admirable equipment of the Canadian quarantines to contend against any threatened invasion.

## CONTEMPORARY LITERATURE.

A STUDY IN DIETETICS.—One of the most notable examples of this new movement toward the better and more intelligent use of food is the experiment which has been recently authorized at the University of Chicago. The results obtained thus far have proved so suggestive and practical as to lead to the belief that similar studies in a modified form would be well worthy the attention of intelligent housekeepers and stewards.

At the opening of the new Women's Halls, October 1st, 1893, it was agreed that it was a fitting undertaking to attempt to supplement the intellectual and educational advantages of the institution with a corresponding care for the physical requirements of the students. Accordingly, under the direction of the women deans, with Mrs. Ellen H. Richards as expert adviser, a definite study and careful investigation was made of the food supply furnished to the occupants of the Women's Halls. The method pursued was to keep an exact record of the amount and cost of all food purchased, and of the number of meals eaten. A supplementary record was made of the amount and cost of all the food eaten each day, for the purpose of determining readily whether a proper variety and proportion of nutrients were provided daily, and whether the daily expenditure of money was kept duly within the amount appropriated for the purchase of food in its raw state.—*From "A Practical Experiment in the Study of Dietaries," by* PROFESSOR MARION TALBOT, *in the March Review of Reviews.*

COST OF DESTROYING A SLUM.—London is spending nearly two million and a half dollars in cleansing and rebuilding one slum. American cities are just beginning to learn how serious is the cumulative evil of slum construction. They may with profit also learn how costly is the necessity of slum destruction. The object-lesson offered by London may be studied with interest in all our large cities, and especially in New York, where, through the efforts of the State Tenement-house Commission, legislation has with much difficulty been secured

which, if enforced, perpetuated, and added to, will tend to prevent the growth of such conditions as London is now compelled to combat.—"*Stamping Out the London Slums*," *by* EDWARD MARSHALL, *in the March Century.*

FOOD IN THE FAR NORTHWEST.—*Fort Resolution* is one of the most important posts in the country. Though it has not so many claims to distinction as Chipewyan, its natural resources for food are much greater; for near by is the most productive fishery in the country; the Dog-Rib and Yellow-Knife Indians generally keep it supplied with caribou meat in winter, and geese and ducks are fairly plentiful in spring. Furthermore, it is the only post that secures any quantity of the country luxury—grease; though the Indians never bring in marrow, which is a very palatable tidbit. The grease they do bring in is the fat from along the back and around the joints of the caribou, which is called hard grease, in contradistinction to the marrow, that is soft. Both of these are used in making pemmican, which is made of dried meat pounded into shreds and mixed with grease, and rolled into balls or made into square or round slabs.

Pemmican, however, is a rare article nowadays, and not to be found anywhere south of Resolution, and only there on occasion. This is chiefly because caribou are not so plentiful as they were formerly, and the Indians keep most of the grease for their own consumption. Nor do they make pemmican to any great extent, their substitute for it being the pounded meat, which is carried in little caribou-skin bags when travelling, and eaten with the grease—a pinch of pounded meat and a bite of grease. I must confess that a plate of pounded dried meat and several good-sized lumps of clear grease were about the most tempting morsels I had set before me at any time on my trip. One never gets enough of grease in the North-land; it is eaten as some in the civilized world consume sugar; in fact, I developed a craving for sweets that even grease did not satisfy, chiefly, I suspect, because the supply was so limited, and somewhat notable in my case for the reason that ordinarily I seldom if ever touch sweets. The absence of bread and vegetables, and the excessive cold, undoubtedly combine to excite the desire for both grease and

sweets.—*From "On Snow-Shoes to the Barren Grounds," by* CASPAR W. WHITNEY, *in Harper's Magazine for March.*

EXACT DOSAGE IN EXERCISE.—Housework, chores, gardening, walking, climbing, cycling, running, swimming, and many other sports give just the kind of exercise that is indicated in certain conditions, due regard being had to the physiological effects of varying dosage. Oertel has shown how the simple exercise of walking may be adapted to sufferers from cardiac debility by prescribing the distance and speed, and the number and length of the rests, on definite paths graduated according to their slope. His interesting and original work has not only given a new direction to the treatment of certain cardiac affections, but is destined to have an important influence in establishing accuracy in the prescription of exercise. Whoever has studied the map of the environs of Reichenhall, Bavaria, prepared by Oertel for the application of his method, will acquire a vivid idea of what precision of dosing in exercise means. In this map the different paths suitable for the work are marked in four different colors, to indicate those that are nearly level, those slightly sloping, moderately sloping, and steep, and figures are placed along each route to show the space that should be traversed in each quarter hour. The locality itself is prepared for its remedial use by placing benches for resting at suitable distances, and by marking on certain trees near the path circles, colored to correspond with the map, to indicate the difficulty of that particular section. By systematic practice on the easier paths the heart and system are progressively trained and strengthened. Intelligent analysis may do the same work for cycling, horseback riding, and many other familiar exercises. In this way the dosage is practically reduced to a definite number of kilogrammetres in a given time, and a step has been taken in placing the prescription of exercise upon a scientific basis.—*From "Exercise as a Remedy," by* DR. HENRY LING TAYLOR, *in Appleton's Popular Science Monthly for March.*

FEMININE ELECTRICITY.—It was reserved for the marvellously fruitful Elizabethan era to beget the science of electricity. Dr. Gilbert, Shakespeare's contemporary, physician

to the Queen, was its founder and the inventor of the term, for he had in mind certain peculiar properties of ἤλεκτρον (amber), and dubbed his special study the amber science. Gilbert died in 1603. Afterward such famous men as Sir Isaac Newton, Sir William Watson, and Benjamin Franklin prosecuted studies in the same field, but how slight the advance that was made in one hundred and fifty years, how little intimation even specialists had obtained of the true nature of their subject, of the incomparable *force* that underlay such feeble experiments as they had made, one may infer from an occurrence in the year 1753. On August 6th of that year a thunder-storm broke over St. Petersburg, and an eminent professor, who had erected and insulated an iron rod to collect the electricity of thunder-clouds, observed the indications of an electrometre that formed part of his apparatus, for this purpose placing his head at so slight a remove that, after a tremendous thunder-clap, his engineer, Sokoloff, saw a great spark or ball of fire shoot from the rod to the professor's head. . . .

Now the end of the nineteenth century seems destined to witness the revenge or rehabilitation of the feminine, even in electricity. The kathode rays, or Röntgen, or "X," or negative rays, the men of science say, are "mysterious." It would be more apt and more humanly interesting to say that they are feminine. Opaque substances are transparent—to feminine rays.—*From Harper's Weekly.*

TESLA A MORE ORIGINAL GENIUS THAN EDISON.—A more original genius than Edison, veritably a wizard, is his young disciple, Nikola Tesla, who was born in Servia and found employment with Edison on landing in America. For small electric lights he dispenses with the filaments inside the bulbs and makes dilute air do their work. He sends currents of high tension through space, without any conductor, at a voltage many times greater than that employed in electrocution. He receives in his person currents vibrating a million times a second, of two hundred times greater voltage than needed to produce death. He surrounds himself with a halo of electric light and calls purple streams from the soil. His experiments are of the utmost promise to the industrial world. His aim

is to hook man's machinery directly to nature's, pressing the ether waves directly into our service without the intervention or the generation of heat, in which such an enormous proportion of the energy goes to waste—90 per cent in arc lighting, 94 in incandescent.—*From "A History of the Last Quarter-Century in the United States," by* PRESIDENT E. BENJAMIN ANDREWS, *in the March Scribner's.*

## ANNOUNCEMENTS.

WE take great pleasure in recording a new honor recently conferred on our distinguished collaborator, WOLFRED NELSON, C.M., M.D., F.R.G.S.

He has recently received from the Queen Regent of Spain the beautiful decoration here represented, the cross of a commander-in-ordinary of the ROYAL ORDER OF ISABELLA, THE CATHOLIC.

Dr. NELSON has lived and travelled for eight years in Spanish America—Mexico, Guatemala, Nicaragua, Costa Rica, Colombia, and Venezuela—and nearly all the West Indian Islands, including six months in Cuba, when that country was at peace and flourishing. Of all of those regions he has written much from sociological and climatological standpoints. This mark of royal favor has been conferred in recognition of the benefits of his writings and works in the promotion of civilization and public health in Spanish America and the West Indies. The honor was announced to Dr. NELSON by cablegram from the Minister of Foreign Affairs in Madrid to the Spanish Minister at Washington. Dr. NELSON is a Canadian, a Fellow of the Royal Geographical Society of Great Britain, and a correspondent of the United Press.

DR. ELIZA MARIA MOSHER, of Brooklyn, has been appointed Professor of Hygiene and woman's dean in the literary department of the University of Michigan. She will also assume charge of the woman's gymnasium when that building is erected. The professorial duties will be entered upon at the beginning of the next collegiate year. Dr. Mosher graduated from the medical department of the university in 1875, and began the practice of medicine in Poughkeepsie, N. Y. For a number of years she has been an eminently successful practitioner in Brooklyn.

AMERICAN MEDICAL ASSOCIATION.

THE forty-seventh annual session will be held in Atlanta, Ga., on Tuesday, Wednesday, Thursday, and Friday, May 5th, 6th, 7th, and 8th, commencing on Tuesday at 10 A.M.

WILLIAM B. ATKINSON,
*Permanent Secretary.*

1400 Pine Street, Philadelphia.

THE AMERICAN CLIMATOLOGICAL ASSOCIATION.

The thirteenth annual meeting will be held at Lakewood, N. J., May 12th and 13th, 1896.

GUY HINSDALE, M.D.,
*Secretary.*

3943 Chestnut Street, Philadelphia, Pa.

AMERICAN ACADEMY OF MEDICINE.

THE twenty-first annual session of the American Academy of Medicine will be held at the Hotel Aragon, Atlanta, Ga., Saturday, May 2d, and Monday, May 4th, 1896.

CHARLES MCINTIRE,
Easton, Pa. *Secretary.*

AMERICAN MEDICAL PUBLISHERS' ASSOCIATION.

THE third annual meeting of this association will be held in Atlanta, Ga., May 4th, 9.30 A.M. A special invitation has been extended to the members of the American Medical Publishers' Association by the management of "Lookout Inn," to visit their magnificent and historic spot *en route* to the meeting in Atlanta.

CHARLES WOOD FASSETT,
St. Joseph, Mo. *Secretary.*

INTERNATIONAL HEALTH EXPOSITION.

At Innsbruck, Austria, May 1st to October 1st. Devoted to physical education, hygiene, dietetics, and sports with their related trades and professions. The exposition is given by the city officials, but is under the auspices of the imperial throne. Among things to be exhibited are gymnasium apparatus, instruments for calisthenics, mechanisms in the Swedish movement cure, sanitary clothing and waterproofs, common-sense footwear, special garments for athletes and for out-of-door games, food preparations for special purposes, the implements of all the popular games employed by the youth of Europe and America, and simple medicinal preparations for light accidents. An American committee has been appointed headed by August Belmont, Herman Oelrichs, Frederic R. Coudert, and Chauncey M. Depew, with offices at No. 13 William Street.

*Margherita Arlina Hamm.*

SANITARY PATENTS OF RECENT ISSUE SPECIALLY REPORTED FOR "THE SANITARIAN" BY E. S. DUVALL, SOLICITOR OF PATENTS, WASHINGTON, D. C.

550,979. Water filter. A. H. Kohlmeyer, St. Louis, Mo.

550,963. Apparatus for removing garbage. W. Goetz, New York, N. Y. Consists of a wagon body formed in its top with a receiving spout, a davit made in two parts, of which the lower part is mounted to turn one side of the body, and the upper part is adapted to be folded upon said body and a support on the side of the wagon body for the free end of the upper part of the davit when folded.

551,342. Apparatus for cremating garbage. C. A. Wentworth, Hyde Park, Mass. Consists of a casing having a garbage inlet at its upper end, a series of fixed annular shelves below said inlet, and a series of fixed scrapers, combined with a rotary shaft within said casing having a series of rotary annular shelves altering with the fixed shelves and arranged to co-operate with the fixed scrapers of the casing, and revolving scrapers alternating with the fixed scrapers arranged to co-operate with the fixed shelves of the casing.

551,381. Water filter. I. T. Hopper, St. Joseph, Mo.

555,388. Means for clarifying liquids. O. E. Michaud, St. Louis, Mo. Apparatus consisting of a casing, a helical way for the liquid within said casing, an annular reservoir concentrically located in said helical way, means of liquid ingress at the bottom of said helical way, means of liquid egress at the top of said helical way, and deflectors in said helical way.

555,685. Water filter. F. W. Edginton, Amherst, Mass.

555,700. Disinfecting apparatus. C. Hersher, Paris, France. A disinfecting apparatus having openings at opposite ends to be closed by doors, in combination with a shaft carrying levers at right angles to each other, the said levers adapted to prevent both doors from being opened at the same time.

555,773. Filter. C. E. Ince, Providence, R. I.

555,888. Holder for disinfectants. H. P. Roberts, Boston, Mass. Comprises a body provided with a perforated pocket, ways connecting said body and pocket, and devices for detachably securing said holder to a basin.

556,161. Electrotherapeutic body-wear. G. Quarrie, Brooklyn, N. Y. A boot or shoe or wearing material provided with one or more electrical conductors extending through the sole thereof, in combination with a plate or insole of conducting material having electrical contact therewith.

# THE SANITARIAN.

## MAY, 1896.

NUMBER 318.

## SANITARY BRUSHWOOD PICKED UP IN EUROPE.

By C. W. CHANCELLOR, M. D.

### No. VII.

#### ANTI-TYPHOID SERUM.

In the course of a communication to the Paris Société de Biologie on the Early Diagnosis of Typhoid Fever by a Bacteriological Examination of the Stools, M. Chantemesse said that last June he had succeeded in immunising several horses against the virus of typhoid fever. He had obtained the serum of such strength, that one-fifth of a drop inoculated into a guinea-pig, twenty-four hours before infection, protected it against a dose of typhoid virus fatal to animals not previously injected with the protective serum. It was ascertained also that injections of the serum produced no injurious effects upon a healthy man. M. Chantemesse stated that he had since employed injections of serum in three cases of typhoid fever. The temperature showed a regular fall from the time the first injection was made, and seven days after the commencement of the injections all three patients were quite free from fever, and had commenced to convalesce. M. Chantemesse added that the cases were not yet sufficiently numerous to permit any trustworthy conclusion to be drawn.

#### OYSTERS AND TYPHOID BACILLI.

Some interesting investigations on the vitality of typhoid bacilli inoculated into oysters have been recently carried out. It appears that during the first fortnight following the introduction of the typhoid bacilli, undoubted multiplication of these microbes took place, but after that time had elapsed a steady decline in numbers was observed. The presence of typhoid bacilli within the oyster was, however, still demonstrable even thirty days after they were first introduced, and they were, moreover, observed in the stomach of the oyster, where they remained unim-

paired in a vital condition. In some other experiments, the water in which the oysters were immersed was also inoculated with typhoid bacilli, and it was actually found that they lived longer within the body of the oyster than in the water in which the latter was preserved. These investigations materially assist in justifying the hypothesis as to the possible contraction of typhoid through the consumption of oysters.

### THE QUESTION OF VIVISECTIONS.

The question of the prohibition of vivisection, which excites certain people in Europe, as well as the United States, has been submitted to the test of popular opinion in a country which governs itself upon communistic principles, and which, therefore, might be expected to give expression to the popular feeling on the subject. A measure for the total prohibition of vivisection was submitted *ad referendum* to the population of the Canton of Schwyz, in Switzerland, with the result that 40,000 votes were given against such prohibition, and only 17,000 for it, while a proposal to allow the procedure for scientific purposes was carried by an equally conclusive majority. *A propos* of this decision, it may be noted that a company has recently been formed in Paris for the purpose of popularizing the Pasteur inoculations. It proposes to erect a hospital, in which the inoculation treatment will be made a specialty, and the capital necessary has been subscribed on the moment. It thus appears that all the braying of the anti-vivisection organizations has been attended with no more substantial result than noise, if, indeed, it has not had the effect of disgusting the public with such an exhibition.

### RÖNTGEN RADIOGRAPHS.

The task of passing Röntgen rays right through the human body has been performed by Dr. Hall-Edwards, who, with an adult subject, has obtained photographs showing the vertebrae and the spinal cord in full detail. Of a hand containing a large amount of diseased bone a Röntgen photograph has been made, with the most instructive results, among which was the discovery of what appeared to be a very clearly defined abscess in one of the bones. A still more difficult case was that in which a needle had to be searched for in a patient's foot. A radiograph of the front portion of the foot gave no trace of the needle. The patient, a youth of sixteen, was then placed with his foot resting sidewise on a covered photographic place, and the Crookes tube

was placed above it. After a moderate exposure, to produce which the rays had to penetrate three inches of flesh and bone, the negative was developed, when the needle was clearly seen. The X rays have also been successfully used by the local postal authorities for detecting coins and other articles transmitted contrary to regulations. A gold coin was wrapped up in a newspaper several times folded, and, a negative having been taken with a short exposure, its position was revealed with the greatest clearness. A volume of 900 odd pages, with thick covers, proved perfectly transparent to the X rays, and, with the eye applied to the cryptoscope, a coin placed between its leaves was easily found.

### A NEW DISEASE—HAT-HEADACHE.

A London M. D. has called attention to a new complaint—a peculiar form of "migraine." He says: "I have been called in by several married ladies who say they suffer from a peculiarly irritable kind of headache which has commenced to trouble them recently. The husbands of nearly all of them told me privately that never had they found their wives so disagreeably snappish; everything seemed to annoy them, especially when they had their hats on. I asked to see the articles, and found them to be like large structures of straw, with masses of flowers and ribbons towering high in the air."

Although "no alarmist," the doctor inclines to think that these exaggerated hats, overladen with ornaments, are the cause of what he describes as the "peevishness, fretfulness, and incipient mental aberration which characterize so many ladies who pride themselves on being always in the fashion." He holds that the weight is too heavy for the delicate cranium of a woman, while the anxiety as to keeping them properly poised on her head is as much too severe for her highly strung nerves. He recommended their discontinuance, and it appears his advice has been attended with the best results for those who followed it. As to the refractory, their condition is said to have become more and more serious every day. Under the irritating influence of the large hat, their "snappishness" is said to be steadily increasing, and their disregarded medical adviser looks forward with apprehension to a future for them in which the Divorce Court towers threateningly in the middle distance, while behind it looms the still darker shadow of the lunatic asylum. It has been suggested

that, if chronology were not opposed to the theory, one might almost suspect that the new hat was the parent of the "New Woman"; but it is, at any rate, possible that these two disgusting novelties may have reacted with injurious effects upon each other.

### THE HYGIENE OF AIR AND WATER.

A benevolent movement has been inaugurated in some of the larger cities of Europe which aims at nothing less than the extermination of all diseases by such harmless remedies as air and water. A new and important association has been created for this purpose, the name of which will be quoted in future as the "Balneological and Climatological Society for the Encouragement of the Theoretical and Practical Study of Balneotherapeutical and Medico-Climatological Methods." The title certainly seems calculated to take one's breath away, but, if the methods alluded to are successful in taking away human diseases without simultaneously wiping out the unfortunate heir to them, it would be wise, perhaps, to regard it as part of the treatment. Simplicity in medicine is a good thing, but there are limits even to simplicity. The question is, Are we really much healthier from the use of the modern mud baths, electric baths, air baths, and the *fin de siecle* "music baths," invented by some musical genius, richer, perhaps, in imagination than current coin? Of course, if the patient be gifted with an exuberance of fancy, his faith may move mountains of disorders, not merely with baths of air, but without them. A story is told of an English tourist, who was wandering about the Black Forest, filling his lungs with the purest ozone. One night, when he was fairly full—not only of air—he retired to his room. Feeling the want of fresh air, and being unable to sleep, he attempted to throw open the window, but made no progress in the dark room, and at last he decided to shatter the pane and pay the damages next morning. Having accomplished the first half of his plan, he sniffed in ravenously the fresh, pleasant breeze from the firs and pines around, and having, so to say, revelled in it for a time, went contentedly to bed and slept soundly. When he awoke on the following morning, to his astonishment, he found the window still hermetically closed, and a costly mirror in the door of the wardrobe shattered to pieces. And this was what he had to pay for. It is quite conceivable that this purist extracted just as much benefit from the air which his fancy created as he could have done, under the cir-

cumstances, from the real article fresh from the hills. Nevertheless, we cannot blink the fact that a good climate and medicinal waters do occasionally rejuvenate those whom all the physic ever prescribed could not benefit.

But what is climate, in the sense which hygienists should attach to the word? In most parts of Europe it is undiluted treachery. The air, as Shakespeare puts it, is a "chartered libertine." Even on the Riviera you can never be sure of the weather for longer than three or four hours on a stretch. Very frequently while the trustful patient is out walking, relying upon the genial sunshine of the forenoon, the scene changes as by the waving of a magician's wand, the "frozen Pleiads" begin to shine, and he or she becomes painfully conscious of "a nipping and an eager air," that "bites most shrewdly." As a matter of fact, however, the effects of a health resort upon an invalid's constitution are the net result of a whole series of causes, which include the surroundings, the diet, the amusements, and restrictions, as well as mere wind and weather. The uninitiated members of the ailing public have no idea of the troubles that are brewing or the pleasures that are waiting for them at European resorts.

At some places invalids are made to suffer from the scourge of clothes. There seems to be a general tendency in modern times to restrict one's self to the absolutely indispensable in matters of wearing apparel, and why watering-places should prove an exception to the rule is one of those mysteries in which balneological science abounds. But so it unfortunately is. A man may come down to his bath in a rough morning-suit without exciting adverse remark or critical comment, but if he values his name and peace of mind, and has a wholesome fear of social ostracism, he must appear in a lighter and finer costume shortly before lunch, and this must be set aside in favor of something more fashionable in the afternoon, while formal evening dress is indispensable later on. The principle adopted would seem to be that it is the clothes which make the cure, whereas they only make the man. And as for the ladies, their changes are so numerous that people with a practiced eye can tell the time of day by their dresses. It should be remarked, on the other hand, that at a fashionable French seaside resort, such as Trouville, the Newport of Europe, no superfluity of clothing is indulged in, and often the ladies' costumes resemble eternity, in that they have neither beginning nor end. Bathers are at liberty to copy

the fashions of any age, however remote, and one sees on the *plage* interesting subjects, whose presence seems to be in response to an invitation to come when they have nothing on. All these and many other important questions should be carefully studied, and the results published by the members of the new society, before the public are invited to accept without appeal balneological sentences of temporary banishment, especially when they involve a journey abroad.

Havre, France, March 21, 1896.

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MUNICIPAL ENGINEERING IN LONDON.—Some idea of the nature and extent of a year's municipal engineering in the City of London may be gathered from the annual report which Mr. D. J. Ross has just presented to the City Commission of Sewers. Of the noiseless materials for carriageway pavements wood comes first in preference, the city now having about 337,543 superficial yards of it, while of asphalt it has 208,278 yards. With regard to lighting, 1,854 gas lamps are still paid for by the commission and 485 arc lamps are in use. The important question of lighting the minor streets of the city by electric lamps, under the contract with the Electric Light Company, has again been under consideration. Experiments with glow lamps and with alternating-current arc lamps not proving satisfactory, it was decided, on the recommendation of the electrical inspector, to make further trials, and arrangements are now being made to light certain streets by continuous and alternate-current lamps, partly on brackets fixed against the front of houses and partly by lamps suspended across the centres of the streets. Water cost the commission £3,425, urinals being responsible for £1,728 of this. In the city there are nearly two miles of subways, while over seven miles of gas and water mains, conduits, wires and tubes are laid in them. No fewer than 7,016 persons were, for various purposes, admitted to these subways during the year. The quantity of refuse taken from premises was 41,821 van loads, and of sweepings off the public ways, 72,633 loads. The destructor apparatus at Lett's Wharf destroyed 23,111 loads of refuse, producing a residuum of 6,205 loads of ashes or clinkers, for the removal of which the commissioners had to pay.—*The Surveyor*, March 27, 1896.

# THE WORLD'S CONGRESS OF MEDICO-CLIMATOLOGY.

*San Antonio, Tex., February 20th-22d, 1896.*

## ABSTRACT OF PROCEEDINGS.*

### HEALTH AFFAIRS, CLIMATE, HISTORY, RESOURCES, OF SAN ANTONIO.

BY DR. RUDOLF MENGER, CITY PHYSICIAN OF SAN ANTONIO.

If we look back into the health and sanitary conditions of San Antonio many years ago, the official records show that in 1866 and 1867 cholera Asiatica, pernicious malarial fever, typhoid and typhus fever, and smallpox prevailed. Undoubtedly the unfavorable hygienic conditions of the city at that time, and especially also the introduction of diseases from the outside, and the dependence of the populace on drinking infected well, cistern, ditch, or river water aided most in producing and maintaining such malignant diseases.

The records show that yellow fever has no chance to exist in this climate, and also typhus fever; both diseases have been introduced from outside in a few single instances years ago, but it never had a chance to spread. Cholera also, I understand, had been introduced into the city by some infected troops, and there was a fearful epidemic of cholera some thirty years ago, but no other case has since occurred, as far as I know.

With the gradual progress of our city and sanitary improvements, better streets and plazas, substantial dwellings, improved water supply, better hospital accommodations, strict municipal and State quarantine regulations and compulsory vaccination, San Antonio has improved a great deal in its health condition, and is still gaining in reputation as a health and pleasure resort since the inauguration of its splendid sewerage system now under construction. Typhoid fever and malarial fevers are by far less prevalent than in past years, and our city has been spared with smallpox since 1892, at which time, and, in fact, in every instance before, it was introduced from the outside, principally from Mexico, and it has always raged mostly among the unclean, ignorant, careless, and densely crowded of the Mexican and colored populations.

*Concluded from page 836.

*Diphtheria* and *scarlatina*, according to our statistical records, especially the malignant type, is of rare occurrence in this climate, occurring only in endemic form during the short, rainy winter months; and measles, whooping cough, croup—in fact, most zymotic diseases, including variola, occur more in mild type.

According to the mortuary reports of our city, there occurred in 1895 only three deaths from scarlatina, four from croup, and three from diphtheria; in 1894 there occurred no death from scarlatina, two from croup, and two from diphtheria; in 1893 no scarlatina; one from croup, and six from diphtheria; in 1892 no scarlatina, none from croup, and two from diphtheria; in 1891 no scarlatina, one from croup, and three from diphtheria, so that during the last five years we had but three deaths from scarlatina, eight from croup, and sixteen from diphtheria.

LUNG DISEASES.

In regard to lung diseases, our mortuary records show, like all other large cities, the highest percentage from phthisis pulmonalis. This disease, although as old as Methuselah, so to say, and a scourge of all climates, is, as we all know, more a plague of modern civilization. In the early history of Texan frontier towns, where there was no railroad traffic and less occasion to inhale all sorts of foreign bodies, as is the case in our crowded factory towns, less mental over-exertion and more physical outdoor life—in those days phthisis pulmonalis was more rarely recorded.

And, speaking of our town, San Antonio, with a large yearly and daily influx of non-resident phthisical patients seeking relief or recuperation in our justly celebrated climate, and the many chances to be infected directly or indirectly through the dried sputa, is it not a fact that our city should be teeming with resident consumptives? Now, if such is held to be the fact, it is not proven by our statistics. At our last meeting of the Board of Health a carefully prepared statistical report comprising eleven years, from 1884 to 1895, was read in order to ascertain and show the status of percentage of pulmonary phthisis among residents, and those that had come here already affected with tubercular diathesis.

During the eleven years the mortality from phthisis has not increased. but, to the contrary, if the increase of population between 1885 and 1895 be considered, decreased. During eleven months in 1895 (this is the time up to which the mortuary records

had been finished at the time of making these statistics), the total number of deaths from all tubercular diseases was 204; of this number, 44 were natives of Texas; 24 lived in San Antonio three and one-half years and upward, and 20 lived in San Antonio two years and less. During the eleven months of 1885 there died, out of 131 deaths from all tubercular diseases, 39 natives of Texas, or 30 per cent. In the eleven months of 1895, out of 204 deaths from all tubercular diseases, 44 were Texans, or 21 per cent; in the eleven months of 1885, 131 died, out of a population of 35,000 inhabitants, or 38-100 of 1 per cent, and in the eleven months of 1895, out of a population of 60,000 inhabitants, 204 died of tubercular diseases, or 34-100 of 1 per cent, or a decrease of 2-100 of 1 per cent in 1895.

I wish to state here that I am much indebted to Dr. A. Graves, Sr., for his valuable assistance in this matter, and also to Mr. Frank Roberts, health clerk, for help in compiling each case of tubercular disease during the last eleven years in San Antonio. Our board of health consists of Dr. F. Herff, the oldest veterinary surgeon of West Texas; Dr. Braunnagel, formerly eight years health officer of San Antonio; Dr. A. Graves, Sr., Mayor Elmendorf and your humble servant.

INFLUX OF CONSUMPTIVES.

There is one point to be considered in this connection, and that is that too many consumptives come or are promiscuously sent here from Northern regions in such advanced stages of phthisis that they would surely fare better in staying at home or near their relatives and friends. There is and can be no restriction, it seems, through State and municipal laws, controlling the migration of consumptives from one State or city to another, but our cities are yearly overburdened with a large percentage of phthisical patients with very limited means, and these, of course, have to be taken care of by our municipal hospitals at the expense of the city, there being no especial sanitariums exclusively for consumptives under State control.

As to direct climatic observations of San Antonio, our weather bureau furnishes carefully prepared observations and forecasts, and the reports are published daily. The average temperature from January to May is 63 degrees; average humidity for same period, 66.5 degrees; mean maximum for January, 62 degrees; mean minimum, 42 degrees. In July, our hottest month, the

mean minimum is 90 degrees.

SAN ANTONIO WEATHER.

One of the leading features of the location of San Antonio is that it comprises principally what is known as the dry belt of West Texas. It is within 100 miles of its eastern limits, and extends west over 600 miles to El Paso; north to the Staked Plains, and south to the Rio Grande and Gulf of Mexico.

The character of our northers is mild—in fact, these northers, representing a cold and dry, northwest wind, continuation of Northern blizzards, seem to be less severe and rarer than in former years. They have the same beneficial influence in purifying the atmosphere as our heavy rains have in clearing the air and sweeping the streets and gutters of our cities of filthy accumulations.

The real cold and inclement weather and the rainy season generally begins toward and after January, and at the beginning of February some of the early wild Texas prairie flowers can be seen in full blossom. In December of each year, during Christmas time, our floral gardens are still in full bloom.

On account of our peculiar semi-tropical climate, and whilst the Northern cities are still in their winter sleep, and blizzards and snow storms sweep over the country, San Antonio is endowed with an early spring season, so that generally the flowers begin to bloom in March, and in April the city, with its many beautiful flower gardens and public plazas and a great variety of shade trees, is perfectly imbedded in a green valley of fragrant flowers, perfuming the air. At this time the valleys and hilly regions around the city and the entire mesquite prairie is covered with luxuriant vegetation, and the wild prairie flowers of beautiful colors and brilliant lustre can be seen for miles and miles away.

Outdoor life is enjoyable for nearly the entire year round, and our surrounding country affords many picturesque places for lovers of hunting, fishing and general picknicking. Our summer is cooler and more agreeable than any portion of the North and East of the same elevation and degree of temperature, and our nights in the hottest summer months are cool, and the Southeast breezes coming from the Gulf of Mexico are most refreshing and invigorating. Sunstrokes, therefore, are more rarely recorded as compared with Northern cities, San Antonio being sup-

plied with a large number of public parks and plazas in the heart of the city, giving ample ventilation to all our narrow streets and houses.

CLIMATE AND SURGERY.

And here again the salubriousness of our Texas climate is evident on the result of surgical cases. Open wounds and ulcers need but little surgical appliances, and septicaemia and pyaemia rarely occur from direct surgical interference and without aseptic and antiseptic precautions. Often difficult confinements or surgical operations of a serious nature have been and are performed in small unventilated Mexican huts, where the patient as well as the surroundings and entire household paraphernalia are anything but clean, and still a brilliant success is achieved in most cases.

The same atmospheric influence is exercised on most respiratory diseases and rheumatic affections incurred in wet, cold climates, and that our bright and dry atmosphere is antagonistic, to a great extent to the presence and development of putrefactive bacteria is shown by raw meat hung up in the air, which will gradually dry up and remain fresh and eatable for a long time. Our poor Mexicans are in the habit of drying large quantities of raw meat hung upon ropes or on the fence. Often carcasses of animals can be seen in the open prairie without giving out any odor, simply drying up or mummifying without putrefaction. These facts, of course, demonstrate how important it is to always allow much fresh air and sunshine in dwellings, especially in sleeping apartments, and to expose the beddings, etc., to the same element during and after sickness, a matter often neglected and even objected to for fear of " ketching the consumption."

DRAINAGE.

San Antonio is supplied perhaps more abundantly with modern improved natatoriums and splendid artificial and medicated mineral waters, than any other Texas city of its size and importance. Our vegetable, fruit and grain market is also nearly overburdened with such abundant supply that the contemplated building of two large union market halls is an urgent necessity for this city. Although our city is situated in a large flat valley, surrounded by evergreen hills, in the northwestern and eastern portion it is naturally very favorably supplied with perfect surface drainage, so there is little or no standing water in its thorough-

fares, the surplus storm water being carried off rapidly through the many surface drainage canals and gutters of the streets and the natural water carriers of the San Antonio river, and four ditches running through the city.

Our modern San Antonio is a highly cultured, wide-awake beautiful and historic city, situated in a romantic valley on both sides of the wide famed San Antonio river, and has a population of over 60,000 inhabitants, the American, German, Mexican, African, Irish, French, and Italian races predminating.

Much more is to be gained from our own experience than from the experience of others. There is perhaps no branch of medicine to which this reference to the remark of Emerson applies with so much force as to that of climatology, for there is probably no branch of therapeutics to which the physician, as a rule, has given so little attention or gained so little from his own experiences. His knowledge of the effects of climate is gained very largely from the often misquoted experience of others, while, as a rule, he lets the personal experiences coming within his own sphere of observation pass without even a mental note of the influence which purely climatic agencies exert upon his patients for either good or evil.

### CLIMATIC ENVIRONMENT.

How often has the physician to contend with disease which seems to baffle every effort upon his part to permanently dislodge, simply because he has followed the proper, the conventional, or the fashionable course of treatment, but has utterly failed to study the relations existing between his patient's temperament, powers of resistance, or hereditary tendencies, and his climatic environment. It does not seem to have yet occurred to the general profession that medico-climatology is an every-day application of the therapeutics of the climate of their own section to the diseases with which they come in daily contact, rather than the application of the misquoted experience of others in prescribing a most radical change for a patient that has, perhaps, passed the point where any change of climate can be of any benefit. It is often the slight change of climate experienced in going but a few miles that has as remarkable effects as those experienced in a radical change from one side of the continent to the other.

### TWO ILLUSTRATIONS.

One of the most marked examples of how slight a change may

effect a radical improvement came to my knowledge when living in the District of Columbia during the war. A gentleman living in Georgetown had been an almost constant sufferer from asthma for many years. In the course of events, the family removed to a new residence about four blocks distant from the old residence, but upon the heights. From the day of removal from the old residence the gentleman was entirely exempt from his old affliction. This was a climatic cure, pure and simple.

A few years later, when living in the Genesee valley in Western New York, my wife was a sufferer from the malarial influences common to the bottom lands of that rich valley. At one time she had been sick in bed for a number of days, and no amount of the proper, conventional, or fashionable treatment for malaria seemed to better matters, so one forenoon of a warm winter day I astonished her by proposing to take her to Warsaw, sixteen miles distant. She was taken out of bed with a temperature considerably above normal, dressed and bundled up in a cutter, and started over the hills. In an hour we were 800 feet above the valley, and in the midst of as hard a blizzard as I ever experienced in Dakota, but, as our road was straight and she was enjoying the "climate," we kept on to our destination. That night she went out to a social gathering, and stayed till 11 o'clock, and went home in a few days like a new person, and for months had no more "malaria." This was a climatic cure pure and simple.

CLIMATIC THERAPEUTICS.

In 1882 I was residing on Long Island and doing office work in New York city. Taking a severe cold, while in an unfavorable condition for throwing it off, and during the season of fogs and rains in that climate, my condition became one of apparent seriousness, and I was advised to get out of that climate. Not because of its appropriateness from a climatic standpoint, but owing to personal influences, I went from New York to Fargo, Dak., the last week in February, leaving the fogs and rains of Long Island for the 30 degrees below zero temperature of North Dakota. It was not the "conventional or fashionable thing to do," but my "net experience" was that it was the proper thing, for in six weeks I was entirely free from my cough, had regained my usual weight, and in three years went from 125 pounds normal to nearly my present standard of 175 to 180 pounds. This was in spite of unfavorable conditions from worry, but was a clear case of climate therapeutics.

I might go on with many personal experiences in a similar line, which have fallen to me, but it would be wearisome to my hearers, for they are not different from those of any physician who has ever experimented with climatic therapeutics in his practice.

But what I would impress is that a more frequent application of climate therapeutics would often relieve the physician and patient from perplexing and persistent symptoms which fail to yield to the proper, conventional or fashionable treatment.

MEDICO-CLIMATOLOGY.

But I started out to say something about the medico-climatologist as a specialist in medicine. Medico-climatology has been very largely confined to the study of the recorded meteorological data of various regions, and the misquoting of the experience of physicians, very often seeing the merits of their particular locality through local glasses, which failed to bring within their focus the glaring defects. Others who have written of the climate of certain sections have traveled through the region on a pass, and made all of the journey possible at night on a sleeper, so as not to see the disagreeable features and be able to write only of the agreeable.

This would not be so bad if the only people interested in the subject of climatology were the wealthy tourist or invalid who, if not pleased with one point, can move on to another, and keep moving till they find a place to suit their whims, whatever may be said of it as an appropriate place for them. But for one such invalid there are ten or perhaps a hundred who cannot rectify the mistake, if made, of getting into an inappropriate locality, and to whom a misrepresentation or a lack of specific information or an error in properly diagnosing their case and making a proper prescription, means the loss of the only chance remaining to them for regaining lost health, and, perhaps, making a home where, if regained, it may be retained.

GATHERING RELIABLE DATA.

There is but one way that the practical specific knowledge of the varying conditions of soil, timber, water, and topography existing between points of common characteristics, so far as general meteorological conditions are concerned, can be obtained, and that is by careful personal inspection of the one fitting himself for the specialty of medico-climatologist. The home-seeking

invalid wants to know, not only that he is likely to better himself from a purely health point, but he wants to know what the prospects are for making a living for himself and family. What are the social and educational advantages to be enjoyed, what are the diseases indigenous to the region that he is likely to subject his family to, for he does not care to go from an insalubrious climate into another, perhaps more so.

The medico-climatologist should be in possession of such facts, and have such acquaintance with the place or region to be recommended, as will enable him to intelligently advise his patient about local defects to be avoided or advantages to be sought. He should have absolutely no personal interests to serve, for the moment that he becomes personally interested in any place, that moment does his power to render an impartial and judicial opinion become impaired.

THE STUDENT OF CLIMATE.

The medico-climatologist should be a man of ripe experience in medicine, and a competent diagnostician; one capable of judging to what degree the patient is likely to be benefited by change of climate alone, and to what extent climate should be allowed to exert its influence without the interference of other therapeutic measures.

He who starts out to find the place that has no drawbacks or no disagreeable features is doomed to disappointment, for there has been but one Garden of Eden, and that was forever lost to poor humanity. He who expects to find a warm, genial climate, with a large percentage of sunshine and very little rain, must expect to endure along with those conditions more or less dust as a natural product of warm and dry weather. Such meteorological conditions are also of necessity, accompanied by more wind and sudden changes than are characteristic of the more moist and humid regions with less sunshine. "Beggars cannot be choosers," neither can the invalid who values life beyond present comfort be too exacting regarding the climatic resort to which he or she will go, for the best climatic conditions are often, especially for the tuberculous invalid, in fact, generally, accompanied by peculiarities which must be endured if the invalid would be cured.

It is as much the duty of the medico-climatologist to know of these adverse features, and to explain their necessary connection

with the climate, as it is that he should know that all consumptives cannot go to Colorado, California, Texas, or Florida with expectation of benefit. But, with a better knowledge of climatology on the part of the profession in general, there will be a growing field of usefulness for the intelligent medico-climatologist.

*Discussion.*—Dr. McKay said the opinion prevails that consumption is increasing in the United States, and especially in cities where large numbers of consumptive patients go for health. That this was incorrect, he said, was shown by Dr. Menger's paper.

Dr. J. B. May of Ohio was most impressed by the statement of Dr. Menger that meat dried in the open air in San Antonio without decomposition and considered this an evidence of the healthfulness of this climate.

Dr. Rowley said he would like to hear what the delegates thought about consumption being infectious or contagious.

Dr. Acomb of Pennsylvania was of the opinion that tuberculosis disease was infectious, and cited two instances where healthy persons had contracted consumption while living in houses that had formerly been occupied by consumptives.

Further discussion of the subject was postponed, and Dr. Paul Paquin of St. Louis was then introduced and read a paper on "Sero-Therapy and Climate in the Treatment of Pulmonary and Laryngeal Tuberculosis." The paper was quite lengthy, and showed great patience and research in its preparation.

Dr. Paquin discussed the various kinds of consumption and the history and method of the sero-therapy treatment. During the reading of the paper every one present gave the closest attention and, on motion, the Congress decided to hold a night session to allow him an opportunity to report a large number of cases of tuberculosis in which he had successfully used the serum treatment.

The convention then adjourned till 8:30 o'clock at night, and immediately after adjournment a large number of the delegates paid a visit to the West End Sanitarium.

*Evening Session* was called to order by President Hurt at 8 o'clock, with a fair attendance of physicians and laymen. Quite a number of ladies graced the meeting with their presence, and showed much interest in the proceedings.

The president read a paper prepared by Dr. W. P. Edwards, of Minneapolis, Minn., on "Climate and Matrimonial Misfits."

Dr. Paul Paquin then continued the reading of his paper on "Sero-Therapy in the Treatment of Pulmonary and Laryngeal Diseases," and reviewed the principle and theory of sero-therapy treatment, which, he said, was to allow nature to assert itself and accomplish what no drug could do. He then read reports of a large number of cases of tuberculosis in the different stages which had been treated with serum, in many of which cases the patients had entirely recovered and all symptoms of tuberculosis disappeared.

At the conclusion of the reading of his paper, Dr. Paquin was loudly applauded.

Dr. L. L. Shropshire, in discussing Dr. Paquin's paper, said if Dr. Paquin could obtain such favorable results from the sero-therapy treatment in the variable climate of St. Louis, much better results could certainly be obtained in the mild and equable climate of San Antonio. He reported a number of cases of tuberculosis treated with sero-therapy in this city, in which he had obtained most satisfactory results. He thought climate exerted great influence on such cases, and deplored the lack of authentic information of climatic conditions in various resorts. The climate of Southwest Texas, he thought, was unequaled by that of any section in the world.

Dr. McKay of Chicago said he had given three years to the study of the effect of climate on consumption, and that he had been greatly instructed by Dr. Paquin's paper. He described the climate in different parts of the country visited by him, and said he had known of cases, diagnosed as consumption, which had been reported as entirely cured by climate alone.

In reply to a question by Dr. Acomb, Dr. McKay said he did not believe there is any such thing as hereditary consumption, but thought it possible for a child to inherit a predisposition to consumption.

Dr. Powers of San Antonio said a great many consumptives had come to New Mexico and the country along the Rio Grande to be benefited, but in more than nine years of experience he had not known of a single instance of a cure. The mortality from consumption among the native Mexicans, he said, was greater than from all other causes combined. He did not believe there is any such thing as a climate cure of consumption, though he admitted that proper climatic conditions might prolong life.

Dr. J. A. May of New Holland, Ohio, said he thought a great

many diseases, such as neurasthenia, etc., could be cured by the proper climatic conditions, but thought the conventional methods of treatment for consumption had effected as many cures as any special method.

Dr. Paquin closed the discussion by saying he had never known of a case of tuberculosis to be cured by drugs under any method of treatment, and that, in his opinion, the only cure that had ever been effected had been under a system that merely assisted nature.

Dr. C. D. Hurt, who has presided over the sessions of the convention, announced that it was very probable that he would leave the city early this morning, and thanked the convention for the honor of choosing him as its presiding officer, and expressed the hope that he would have the pleasure of meeting the members again at the next meeting of the congress.

THIRD DAY.—The session was called to order at 10 o'clock by the secretary, Dr. McKay, the president, Dr. Hunt, being absent.

Dr. Johnson of San Antonio read a paper on "The Climate of Southwest Texas in Relation to Diseases of the Upper Air Passages."

In the description which followed, Dr. Johnson, replying to a question, said atropic catarrh was very scarce here, the climate not being favorable to its development.

Dr. A. F. McKay of Chicago said the climate of Colorado, because of the high altitude, dust and rarefied air, was especially favorable to the development of atropic catarrh. He said he went to Rockport, Texas, several years ago, and while there met a physician who had established a sanitarium for the treatment of diseases of the nose and throat. The physician told him that he found that his patients got well without aid, and he was thinking of moving away. When he visited Rockport again recently he found that the physician had kept his word and moved away, the climate having cured all his patients. He said the work of the Climatological Congress was not to find the best place, in the general sense, but it was to ascertain the facts regarding all places and let the physicians prescribing climate cure for patients select according to facts. "But I will say," he continued, "that I believe the climate of Southwest Texas, as a whole, is adapted to as many diseases and is as favorable as a general health resort as any portion of the United States."

Dr. McKay then read a paper on "The Commercial Value of Climate."

The president read a paper prepared by Dr. W. Thornton Parker of Massachusetts on "The Need of the Establishment by the Government of a Sanitarium for Consumption." He advocated the establishment of a national sanitarium on some of the abandoned military posts in New Mexico and Colorado.

Dr. J. T. Acomb of Pennsylvania believed the proposition was a good one, and he favored such a sanitarium being established.

Dr. J. A. May of Ohio asked if it was intended to establish a sanitarium for the scientific investigation of consumption or for the care of all consumptive patients who might apply. If the former, he favored the proposition, otherwise he was opposed to it.

Dr. Paul Paquin of St. Louis doubted if the general government had the constitutional right to establish such a sanitarium. It might have the right to establish such a sanitarium for old soldiers and sailors, but not to undertake to care for all consumptives.

Dr. M. J. Bliem of San Antonio said he doubted the practicability and advisability of establishing such a sanitarium by the government.

Dr. A. F. McKay of Chicago favored the passage of a resolution asking the United States government to establish a station for experiments in the treatment of tuberculosis.

Dr. M. J. Bliem thought Dr. McKay's suggestion was a good one, and he believed it a good idea for the government to establish such experimental stations in different parts of the country for scientific study of pulmonary diseases.

Dr. J. B. May moved that a committee of three be appointed to draft a resolution expressing the sense of the congress on the proposition to establish sanitariums for scientific investigation of the disease of consumption, such sanitariums to be established in different parts of the country and to receive only such patients as are willing to submit themselves to experiments.

As a substitute, Dr. Bliem moved the appointment of a committee of five to prepare such a resolution and report at the next annual convention of the conference. The motion prevailed and the chairman appointed Dr. Paul Paquin of St. Louis, Dr. Milton J. Bliem of San Antonio, Dr. C. D. Hurt of Atlanta, Ga., Dr. J.

A. Bell of New Holland, Ohio, and Dr. J. T. Acomb of Tideout, Pa., members of the committee.

The time and place of the next meeting will be fixed by the executive committee, but the convention, by vote, expressed its preference for Atlanta, Ga.

The convention then adjourned sine die.

## CINCINNATI WATER SUPPLY AND TYPHOID FEVER.

At the November meeting of the Academy of Medicine of Cincinnati, a committee having been appointed to investigate and report upon the condition of the water supply of this city, beg leave to present the following:

One of the most important questions that can concern the health, comfort and material prosperity of a city is a pure and abundant water supply. No more important sanitary problem now presents itself to the people of Cincinnati than that concerning our water. The rapid increase of population in the last few years, and the greatly increased contamination of our source of water supply consequent thereon call our attention to the fact that our present works are not only inadequate to furnish in sufficient quantity all the water needed for domestic and manufacturing purposes, but that the source is an unsafe one.

Our city has the unenviable reputation of being the only one of the larger cities of the United States that has, in the last quarter of a century, made no practical effort to improve the character of her water supply, and in the matter of service our water works have not kept pace with the increased domestic and manufacturing wants. The attempts that have been made to improve the old works were adequate to the greatest requirements of the city, the water is, much of the year, unfit for domestic uses. What respectable hotel or restaurant places our city water before its patrons until it has been filtered? How often do we hear the note of warning from sanitarians that our water must be boiled to render it safe!

Is there any reason why our annual death-rate from typhoid fever should be from 50 to 135 per 100,000 of population, while that of Brooklyn is 15, that of New York 17, Cleveland 27, Boston and New Orleans 28, and St. Louis 31? Seven European

cities, aggregating seven and three-quarter millions population, using filtered water, had, in 1894, death-rates from typhoid fever ranging from 4 in Berlin to 15 in London—the average being less than 6¾ per 100,000.

Not one city in the United States of over 300,000 population has so high a death-rate from the water-borne diseases as Cincinnati. Is it not time for her to join the procession and keep abreast with the rest of the world in the works that will enhance her material and sanitary interests? The betterment of our water-supply is a question vital to the health and prosperity of the community, and its consideration cannot be long deferred without risk of inviting greater scourges from the water-borne diseases.

These facts should call our attention to the necessity of providing, in the not distant future, another source of supply, or putting into operation some appliances for the purification of the water from its present source.

We may take it for granted that the Ohio river must continue to be our source of supply for the following reasons: All of our small streams are proportionally much more contaminated than the Ohio. Experiments in different parts of the city with artesian wells show that the water underlying this region is too strongly charged with sulphur and salt to be fit for either domestic or manufacturing purposes. Nowhere within reasonable distance of Cincinnati has there been found an underground supply sufficient in quantity and purity to meet the requirements of the present day, to say nothing of the increased demands that will be made from time to time by reason of the growth of population and manufacturing interests.

While in some of its physical characteristics—turbidity and color— it is not at all times up to the highest standard, in others —taste and softness—it is, except in very low stages of the river, an exceptionally good water. The last quality is one not obtaining in other sources of supply in this section of the country, and it is one of especial importance in a place with such a soot-laden atmosphere as ours. Any other than a soft water would add greatly to the cost of living and to the discomfort caused by such frequent ablutions as are here necessary. That our present supply is not only not sufficiently pure for health, but is not up to the standard required from an esthetic point of view, is manifest to all. That it is deteriorating is equally manifest.

This leads to the sources of contamination. Our water-works were located when the city extended but little above the mouth of Deer Creek. At that time the water from that part of the river was sufficiently pure for all purposes, but the growth of the city along the river to the mouth of the Little Miami has produced sources of pollution not then existing. One present and rapidly increasing source of danger is contamination by sewage within the city limits above the intake of the water-works. Several sewers now pour their filth into our water-supply, some of them within a short distance of the intake. Others are in contemplation. Without any additions, the amount of sewage, soil-soakage and seepage from numerous vaults near the river bank is enough to condemn our present source of supply. Other sources of defilement are to be found in the street-washings, butcher and tannery refuse, and waste materials from the East End Gas-works and factories along the river. But probably the greatest source of danger is to be found in the pollution of the Little Miami River, caused by the increase of population and industries along that stream.

There is no hope that this organic pollution of the water taken from a point near our present works will ever be remedied. Chemical analyses made at different times and by different persons seem to show that it is increasing. The results obtained by Prof. Stuntz in 1880, by Profs. Holmes and Langenbeck in 1887, and more recent tests made by order of the Ohio State Board of Health by Prof. Dickoré in 1891 and 1892, and by Prof. Howard in 1895, show the presence of free and albuminoid ammonia, nitrates, nitrites and chlorine in quantities inconsistent with that degree of purity that we ought to have.

Information derived from chemical analyses, it is true, is not all that is required in pronouncing upon the safety or danger of water. It is but one of the aids, but is mostly a trustworthy one. The chemical processes indicate the presence or absence of those contents that guide us in estimating the character of a water. They are useful in measuring the amount of pollution or showing the putrefaction that may have taken place. In interpreting the results of these analyses our conclusions as to safety or unsafety must often be determined by ocular inspection of the source of the water and by biological examination to determine the presence or absence of animal or vegetable organisms whose favor-

ite habitat is impure water. In the case of Cincinnati water-supply these have supplemented the chemical analyses, and all demonstrate beyond doubt that we are supplied with a water which, in its best condition, is barely passable, and is oftentimes grossly polluted and unsafe. But we need no chemical or bacteriological examination to convince us of the contamination of our water-supply. The location of many of our sewers is sufficient evidence that pollution is taking place.

Is it possible for us to obtain a better supply by going above the sources of contamination here mentioned?

The application of the means of determining the presence of impurities in water to samples taken from above the local sources of pollution gives better results. The chemical examinations by Profs. Holmes, Langenbeck and Dickoré, and the biological examinations by Profs. Oliver and Evans, show that the water of the Ohio taken from above the mouth of the Little Miami is better than that taken at the present intake, but even this is not so pure as to be safe at all stages of the river without purification. The advantage of going above the mouth of the Little Miami for our water-supply would be that the amount of sewage and other impurities would be much less, and their removal could be more certainly, easily and cheaply effected. The benefit obtained would be more than commensurate with the outlay involved. With any one of several methods of purification now in use, the dangers that lurk in our drinking water could be removed without greatly exceeding the cost of distribution of the unpurified water—a cost insignificant as balanced against the value of lives saved, pain and anguish averted. A pure water-supply for Cincinnati would mean the saving of over one hundred lives each year by the reduction of the number of cases of typhoid fever, and many others by the reduction of cases of other water-borne diseases. If only twenty lives were saved in a year, their money value would be more than sufficient to meet the increased cost of construction and operation.

But the loss to the community by the extinguishment of valuable lives is not the only loss. Each death from typhoid fever indicates the existence of at least thirty or forty cases of disease—so many persons rendered helpless for weeks or months, many of them between the ages of twenty and seventy—the "effective period" of life. Add to this impairment of bread-winning effi-

ciency the time on the part of nurses and attendants coincidently withdrawn from the producing period, the cost of medicines and medical attendance and other expenses inseparably connected with sickness, and it will be seen that the money loss to the community will be large—how large we do not pretend to estimate. Nor can we place in definite form the misery which the sickness and death of so many persons bring upon their kindred. Would not the money outlay to secure such purification as would minimize the dangers of water-borne diseases be a profitable investment? To this question there can be but one answer.

From the results of long-continued investigations and experiments, both in America and Europe, our knowledge of the removal of bacteria and organic pollution from water by sand filtration has been much enlarged, and recent experiments with mechanical filters have given encouraging results with regard to their efficiency in the same direction. Experiments have shown that the removal of disease germs by filtration exceeds the bacterial reduction. Observations at the Lawrence Experimental Station show that it is less difficult to remove typhoid bacilli from water by filtration than those bacteria for which water is the natural habitat.

It is the opinion of your committee that sedimentation and filtration, or purification by some other approved method, may be relied upon to remove from Ohio river water the sources of danger therein contained.

After careful consideration of the question referred to your committee by the Academy, we cannot do better than to reiterate the conclusions reached four years ago by a committee of the Ohio State Board of Health, appointed in accordance with a joint resolution of the Sixty-ninth General Assembly, to make an investigation of the pollution of the Ohio river with special reference to public water-supplies derived therefrom.

Those conclusions with reference to the supply of Cincinnati are:

"1. The present water-supply of Cincinnati is dangerously polluted, and should be abandoned as soon as possible.

"2. The Ohio river above all local sources of contamination offers the best available supply; and

"3. This supply cannot be safely used without purification."

With these conclusions your committee is heartily in accord.

That the selection of a proper water-supply for a city is a matter not to be determined by medical men alone is freely admitted. They may, by chemical and biological examinations, pass upon the quality of water, and when dangerous conditions exist, place the seal of condemnation upon a source of supply or demonstrate evils the removal or avoidance of which will present problems for the hydraulic and civil engineer to solve. As we are not merely meeting the emergency of to-day, but propose building for the future as well, an undertaking of such magnitude will present problems that should receive the careful consideration of experts in sanitary and engineering science.

That the work will involve the expenditure of considerable money is also admitted, but what is a monetary consideration compared with a work so necessary for the health and business prosperity of the city! From a purely economic point of view, it is a work that will richly repay us for the money outlay in increased comfort and improved healthfulness.

Respectfully submitted,

BYRON STANTON,
J. C. CULBERTSON,
ALBERT H. FREIBERG,
C. A. L. REED,
THAD. A. REAMY.

After a discussion of the above report the following preamble and resolution were offered and unanimously adopted. The meeting was full, and expressions were all favorable to the work of the committee and its satisfactory report:

Whereas, The committee appointed by the Academy of Medicine has brought in a report narrating in detail the conditions which make it imperative that the city of Cincinnati take active measures to secure such legislation as will enable the municipality to proceed in such a way as to obtain at the earliest practicable time a reasonable pure water-supply.

*Resolved*, That the city authorities, Merchants' Exchange, Commercial Club, Board of Trade, Engineers' Club, newspaper press and other public organizations, be requested to actively co-operate with the Academy of Medicine in bringing this subject to the attention of the Legislature.—*Cincinnati Lancet-Clinic*, Nov. 30, 1895.

# THE CLIMATE OF PHOENIX AND THE SALT RIVER REGION OF ARIZONA.

By W. LAWRENCE WOODRUFF, M. D., Phoenix, Arizona.

The inquiries about Phoenix and the Salt River Valley as a health resort are becoming so numerous that I take it the profession at large will welcome *facts* concerning this valley, and facts only I will endeavor to state in this article. My aim is to cover the ground fully with the most reliable data attainable.

Phoenix and the Salt River Valley are situated in latitude 33° north, in the southwest quarter of Arizona. The valley is from five to seventy-five miles wide, and about two hundred miles long, and throughout its entire length and breadth has a climate claimed to be the best in the world. To rightly appreciate the claims of this valley as a health resort, we must for a moment look at the physical geography of this region. There are high mountain ranges to the north and east, also the Sierra Nevada and Coast Ranges to the west, with a short spur of low mountains to the south. The high mountain ranges protect this section from all cold winds, and to this protection from cold nature has added yet another feature, which is mainly the cause of the phenomenal climatic conditions found in this region, namely, proximity to the Gulf of California. The Salt River Valley, with the Gila Valley, its extension to the southwest, is an open valley with continuous mountain chains of more or less altitude on either side, and practically maintains these characteristics clear to the head of the gulf. The Gulf of California, with the Coast Range on its west to protect it from cold northwest winds, and a lower mountain range east of it, is so situated that it catches and retains the warm winds and ocean currents from the Indian Ocean and the equatorial Pacific, and passes them up to the head of the gulf, and, consequently, is largely responsible for the warm, mild winters. It will be seen by the above how nature has provided a channel whereby in this southwest corner of the United States she has reproduced a climate tropical in all its essential parts, with none of the drawbacks of the tropics, namely, excessive humidity and malaria. Here, right in our

midst, nature has given a climate as mild and balmy as that of the tropical Pacific Islands, and with the same even temperature, and at the same time at an altitude of only eleven hundred feet, a dryness of atmosphere equalled by few localities and excelled by none other in the civilized world. It will now be understood how a climate that seldom gives a temperature at the freezing-point, with rarely a cloudy day—there is less than one in ten during the winter, and for weeks at a time during the summer there is not a cloud in the sky—is possible at this latitude. Here is found every element that goes to make up a perfect climate. The best proof on this point is the exceptionally low death-rate, which is 8 11-100 per 1,000 inhabitants. This sun-kissed valley has but two seasons—the winter season, which is a happy blending of fall into spring, and the summer, which commences about May 1st and continues until about October 1st. The summer days are bright, clear and hot, with a maximum daily temperature ranging from 96° to 112°. It is as rare for the mercury to go above this in summer as it is rare for it to go below the freezing-point in winter. There is usually some little rain in the latter part of July or during August, usually in showers, possibly averaging an inch of rainfall during the summer season. To rightly appreciate the effects of the summer heat, one must recognize the difference between a wet- and a dry-bulb thermometer. The difference is usually from 20° to 30°. Here the reading of the wet-bulb gives our actual sensible heat, while in more humid countries the reading of the dry-bulb is so nearly like that of the wet-bulb that the difference is rarely perceptible. The average humidity is only about 30 per cent for the year, and there are weeks at a time during the summer when it will run far below this point. This is the reason, coupled with the fact that there is always a gentle breeze stirring, why our summers are not only endurable, but, in fact, do not cause as much discomfort or prostration as is experienced in other parts of the country. The summer months are the healthiest of the year. During these months the death-rate is only one-third of one per cent. Bowel troubles and fevers are almost unoknown during the heated term, there being less than two deaths per month from all forms of bowel troubles among infants in a population of 14,000. Is there another place in the world that can make such a showing? During these months

perspiration is very copious, and, owing to the very dry air, evaporation is instantaneous and a material aid to comfort. With this statement the fact will be readily understood that rheumatism, kidney diseases and diseases of the respiratory tract make their greatest improvement during this half of the year. This is especially so with persons suffering from insomnia and nervous prostration. Sunstroke is unknown, and it is as safe for people to come here during the heated term as at any other time of the year.

Now, as to the winter months. The visitor will find the days balmy, dreamy, restful; the air pure, dry, bracing; the nights cool and delightful. Save during the rainy season, it is perfectly safe and comfortable to be out of doors day and night. The rainy season usually lasts a week or so, and the rainfall is not heavy. The annual precipitation is something less than seven inches. The following table shows the maximum temperature for a period from December 31, 1894, to January 9, 1895, inclusive, at several places. An examination of this table will show that

| DATE. | Phoenix, Ariz. | Los Angeles, Cal. | Jacksonville, Fla. | Tampa, Fla. | St. Augustine, Fla. | Hot Springs, Ark. | Nice, France. | Malta. | Cairo, Egypt. | St. Moritz, Switzerland. | Rome, Italy. |
|---|---|---|---|---|---|---|---|---|---|---|---|
| December 31, 1894.. | 74 | 61 | 44 | 60 | 28 | 39 | 51 | 59 | 65 | 50 | 44 |
| January 1, 1895..... | 74 | 63 | 49 | 60 | 28 | 49 | 53 | 59 | 65 | 50 | 39 |
| " 2, " ..... | 68 | 61 | 60 | 58 | 52 | 49 | 53 | 59 | 65 | 48 | 35 |
| " 3, " ..... | 72 | 61 | 60 | 68 | 60 | 50 | 46 | 52 | 65 | 57 | 35 |
| " 4, " ..... | 70 | 55 | 61 | 52 | 50 | 50 | 46 | 57 | 63 | 52 | 35 |
| " 5, " ..... | 68 | 55 | 54 | 62 | 52 | 49 | 44 | 54 | 64 | 52 | 28 |
| " 6, " ..... | 70 | 53 | 62 | 62 | 52 | 49 | 46 | 54 | 63 | 57 | .. |
| " 7, " ..... | 68 | 57 | 75 | 62 | 52 | 49 | 42 | 54 | 65 | 50 | 41 |
| " 8, " ..... | 65 | 62 | 74 | 62 | 68 | 48 | 41 | 59 | 64 | 42 | 39 |
| " 9, " ..... | 64 | 68 | 68 | 78 | 63 | 49 | 50 | 54 | 64 | 42 | 39 |
| Range of Temp. for the 10 days..... | 10 | 15 | 31 | 26 | 40 | 11 | 12 | 7 | 2 | 15 | 16 |

Phoenix has the most even temperature of all the places named, with but two exceptions, one being Cairo, Egypt, whose highest temperature is 65 degrees—but one degree above our lowest, 64 degrees—and Malta, with 59 degrees as the highest point reached, being 5 degree below our lowest point. These two places—as, indeed, do all the rest name—have a damp, moist atmosphere, which greatly increases the perceptible difference in the range of temperature.

This valley has everything that goes to make up a perfect winter home. It has the minimum of rainfall—7 inches per annum; second, the minimum of atmospheric moisture—30 per cent humidity; third, it has the minimum of air movement (its annual average is less than 2½ miles per hour, and is generally from the southwest; fourth, the minimum of death-rate, being but 8 11-100 per 1,000 inhabitants; fifth, the minimum of malaria, there being none; sixth, low altitude—1,100 feet above the sea-level; seventh, the maximum sunshine—an average of 9 days out of 10 of bright sunshine, when out-of-door life is enjoyable and healthful. We have here with in easy reach and within the bounds of our own country, all the merits ascribed to Italy or Egypt, with none of their drawbacks. We have all that Florida enjoys, with none of her moist, sticky atmosphere and none of her malaria. We have the same balmy air and even temperature of California, without her fogs, dampness or malaria. We have the same dry, bracing air that has Colorado, without her blizzards and high altitudes. We have all, and infinitely more, of all the good things claimed for these localities, without their unfavorable conditions. There may be a few localities where the actual difference in temperature between day and night is less than in the Salt River Valley, but these places have much grater humidity. As in summer, so here in winter, with our very dry air, the perceptible difference between day and night temperatures, and the actual discomfort experienced thereby is much less than is the case in localities with more moisture in the air. Situated in the midst of this valley, about 150 miles from the head of the Gulf of California, 1,100 feet above the sea-level, lies Phoenix, the capital of Arizona and the metropolis of the Salt River Valley. It is the healthiest city in the known world, and is surrounded by a prosperous and constantly growing farming community. It has all the modern improvements and the snap and vim of the young metropolis. Her citizens are quiet, peaceable and law-abiding, and ready to receive with true hospitality those who seek her perpetual sunshine. The town is making a phenomenal growth, in spite of the hard times, and will soon have the best of accommodations for the health-seeker, who will find the pure, dry, warm, health-giving air free for all.

The following comparative mortality table shows the yearly deaths in 1,000 inhabitants in the cities named. It will be no-

ticed that Phoenix stands at the head of the list. Phoenix, Ariz., 8 11-100; Los Angeles, Cal, 14 40-100; Long Branch, N. J., 9 88-100; Atlantic City, N. J., 18 38-100; St. Paul, Minn., 9 60-100; Minneapolis, Minn., 9 40-100; San Bernardino, Cal., 11 30-100. There are no public records from which an accurate table of vital statistics can be compiled. The records of the undertakers in the territory named are accurate and complete for the past three years, and include, with very few exceptions, all the deaths in that territory during the period covered. These records have been kindly placed at my disposal, and from them I have prepared the following table with a great deal of care. For all practical purposes it is accurate and reliable.

The following statement will illustrate the general healthfulness of this valley under one set of conditions:

PHOENIX, September 28th, 1895.

Dear Doctor: I have been working large gangs of men in construction-work of different kinds, for the last fourteen years, in the Northwest and in Canada. Last spring, I brought in a large gang of men from Minnesota, and for the last six months have been working them with others in your valley, and never, in all my experience, has the percentage of sickness been so low as during these past six months.

Signed S. R. H. ROBINSON.

Superintendent Minnesota and Arizona Construction Company.

Now, as to diseased conditions: Asthmatics usually receive prompt relief and a permanent cure. The dry, warm air, and low altitude agreeing with them perfectly. If there is a recurrence, it is during the rainy season, and is usually but slight, to disappear again as soon as the usually dry atmospheric conditions prevail. This is equally so of aphonia, bronchitis, and laryngitis; and, in fact, of all diseases of the respiratory organs. Tuberculosis, by the dry, hot air of summer, is checked in its development; and, if the patient is not in the last stages, a continuous residence under these favorable conditions, will greatly prolong life, and often eventually bring about a cure. Let me say here, if the patients have entered the last stage of the disease, in the interest of humanity keep them at home. This cannot be emphasized too strongly. There they will have more comforts, and the radical change of climate, with the long and tiresome journey necessary in reaching here, only tends to materially

hasten the end. During the winter months, this class of patients, in common with all others, may reasonably expect to hold their own, and usually make substantial gains. It will

Vital statistics of that part of the Salt River Valley north of the Salt river, west of the Verde and east of the Agua Fria, covering a territory of 250 square miles, and including the city of Phoenix. The population, on a conservative basis, at 14,000.

| | 1892. | 1893. | 1894. | Total. |
|---|---|---|---|---|
| Total No. deaths | 133 | 185 | 168 | 487 |
| Transients | 29 | 38 | 41 | 108 |
| Accidental deaths | 10 | 15 | 7 | 32 |
| Among residents | 94 | 132 | 120 | 346 |
| Percentages – fractions 1 per cent | ¼ | ⅛ | ⅛ | ⅐ |
| *Classified by Ages.* | | | | |
| Deaths under 5 years of age | 28 | 59 | 33 | 120 |
| Deaths over 70 years of age | 12 | 8 | 13 | 33 |
| Deaths over 50 years of age | 31 | 32 | 36 | 98 |
| *During the Summer Months of May, June, July, August and September.* | | | | |
| Total | 41 | 75 | 54 | 170 |
| Transients and accidental | 8 | 21 | 13 | 42 |
| Residents, from natural causes | 33 | 54 | 41 | 128 |
| Percentages – fraction 1 per cent | ¼ | ⅛ | ⅛ | ⅛ |
| Under 5 years of age | 6 | 28 | 13 | 47 |
| Under 5 years of age, of bowel troubles | 6 | 11 | 9 | 26 |
| *Causes of Death.* | | | | |
| Stomach and bowel diseases | 10 | 30 | 21 | 61 |
| Nervous and brain diseases | 17 | 8 | 4 | 29 |
| Typhoid fever | 2 | 4 | 4 | 10 |
| Scarlet fever | 1 | 3 | 0 | 4 |
| Measles | 0 | 4 | 0 | 4 |
| Diphtheria | 0 | 5 | 2 | 7 |
| Heart disease | 8 | 1 | 7 | 16 |
| Diseases of respiratory organs | 50 | 73 | 61 | 188 |
| Old age | 4 | 4 | 6 | 14 |
| All other causes | 40 | 56 | 58 | 154 |

Note—Deaths designated as transients are only those of persons who have been here but a brief period prior to their decease, they coming as a *dernier ressort* in the advanced stages of diseases of the respiratory organs.

A large proportion of those claimed as residents ought to have been included in the transient class.

readily be perceived, by a careful perusal of this article, that there is greater reason to expect beneficial results in all diseased

conditions from a sojourn in this climate, than in any other winter resort. While this is undoubtedly so, it is equally true that the hot, dry air of summer produces the best results. In heart diseases we find the cooler weather of winter the most beneficial. In some cases the reverse is true. The hotter and dryer it gets, the more comfortable the patient becomes. This is especially so where the disease is complicated with diseased kidneys, or a rheumatic diathesis. Catarrhal conditions of head and throat are most relieved during the summer, especially the moist varieties. Diseases of the digestive tract, dyspepsia, chronic dysentery, and diarrhoea, do exceedingly well here, and are usually promptly relieved. This is doubly true during the hot months. The summer conditions, of high temperature and low humidity, cause a determination of blood to the surface, and for months at a time maintaining it there, thereby entirely relieving all internal congestions. Kidney troubles are so prevalent I must not forget to mention, that during the heated term the kidneys excrete less than one-half of the normal quantity of urine. During this period of rest, the unloading of the effete material of the system is carried on by the sweat-glands of the skin, and a healthy equilibrium is maintained. This continuous high temperature and very dry air keeps the blood at the surface, thereby making the sweat-glands very active. Perspiration is constant and copious, and, by its instant evaporation, keeps the surface cool and the bodily temperature at normal. These conditions are very advantageous to diseased kidneys, giving them a much-needed rest, and an opportunity to recuperate. When to this is added a drinking-water pure, wholesome, and devoid of all alkali, it is easily understood why this valley is fast getting an enviable reputation for the alleviation and cure of all forms of this disease. In rheumatic affections, while in winter they are made very comfortable, it is in summer that the constant free perspiration maintained for months without ceasing entirely eliminates from the system all morbid material. In diseases of the nervous system, so prevalent in this age, this climate is a true panacea. This is especially so of persons suffering from insomnia and nervous prostration. Here, again, the best results are during the summer months. The universal verdict is, "I have nowhere else slept as I do here." This is the universal expression. The tired-out starved nerves,

over-worked and over-wrought, experience in this balmy air the perfect relaxation and rest they so long have been in need of. The dry, hot air of summer seems to quiet the nervous system, is soothing, restful, and when to this a voracious appetite is added, with perfect digestion, which is the only epidemic during this season, the results are understood without further elaboration. Finally, the perfect summer nights soothe and rest one's nerves as does nothing else in all the world.—*Hahnemannian Monthly.*

SOME NEW QUACKS.—At the present time Los Angeles is passing through an epidemic of quackery. It must be admitted that this disease is somewhat endemic in this city. But the specimens who are permanently settled here, while *rank* enough, make but a precarious existence. Some of the old frauds still inhabit dingy dens marked "Medical and Surgical Institute." They advertise on a small scale, lie on a large scale, and make their daily round of professional ignominy, till one by one they pass away "unwept, unhonored and unhung." To enliven these slow-going quacks, there have this year come to town a more audacious set—the self-styled *specialists*, who take up whole pages of advertising in the Sunday papers. With this hush-money they muzzle the press. The tricks to which they stoop are amazing both as to audacity and meanness. One concern, represented to be comprised of several eminent specialists, is only *one* man whom the office boy addresses by different names at different hours.—Dr. Brown at nine o'clock, Dr. White at twelve, and Dr. Green at four—a veritable medical chameleon! Another medical bunco shop sells bottled gasoline as a wonderful lineament which "rubs in quickly." Still another brood actually got $250 for opening a simple abscess, and showed the thankful lunatic pieces of chopped up liver which was supposed to be the cancer removed from the wound.

Some of these concerns have working for them starved out doctors, others employ medical wrecks from alcoholism or morphinism. "But the jingle of the guinea helps the hurt that honor feels." For the time being the Chinese hobo is eclipsed by the electrical fakir and the cheeky charlatan.—*Southern California Practitioner.*

# SEXUAL PURITY.

By S. D. McConnell, D.D., LL.D.

In what does purity consist? What is its law? Upon what sanction, human or divine, does the law rest? Is the law equally binding upon men and women?

To these questions the Social Purity League would give one answer. The average practicing physician would give another. The law of the State is based upon ideas differing from both replies. The church gives an answer differing somewhat from all of them. What is the actual will of God and the will of nature on the subject? We may be certain that the two wills will coincide. If we can find out precisely in any case just what nature wishes we may be quite sure that we have found out what is the will of God in that case. For nature is God's way of expressing Himself.

In the case of sex relationships it may as well be confessed that nature does not seem to know her own mind. This is the origin of the whole moral confusion upon the subject. In other appetites and desires nature is a trustworthy guide. Their existence is *prima facie* proof of their innocence. They are warnings of needs. They protect themselves against abuse by the sense of satiety. Why not "follow nature" here as elsewhere? The instant that proposal is baldly made, all men see that it will not work. As a social rule it is condemned by the practically unanimous vote of society. And it is not civilized and Christian society alone which condemns it. Unregulated intercourse at will is not permitted even by the lowest savages. Among the lower animals it is not possible. In men it is physically possible, but is limited and regulated by the social instinct. Those limitations have the force of law, and are maintained by an appeal to religion. What then are they, and ought they to be?

The first prohibition is of *adultery*. What is adultery? The legal definition is slightly different, but the practical definition is: sexual connection with another man's wife. In what does the wrong of the action consist? The answer is, it is a wrong to the woman's husband. This is the view which the law

takes of the matter. This is the view of the Old Testament Scriptures. The adulterer was punished as a thief, and the adulteress as a warning. Besides that it was an offense which struck at the root of a society which was organized about the tribal principle. It "defiled the blood." That offense has always been so sternly condemned by all men that we need not dwell longer upon it. Any man guilty of it flies in the face of nature, society, and God, and among the three he will find his punishment.

But what about the commerce of the sexes which does not involve the element of trespass and does not defile the blood? What is the absolute and ideal right? Is the law the same for all? Should all be alike punished for its breach? Let us take this last question first. Should the man and the woman be held to the same accountability? The answer is, they cannot be. The cry, "the same law of purity for both sexes," is both silly and mischievous. The champions of this movement do not seem to perceive that in the leveling process attempted the woman is quite as likely to be dragged down as the man is to step up. Nothing is gained by ignoring facts. Society punishes the woman's fault far more cruelly than it does the man's, simply because it believes the fault to be far more heinous in her than in him. One element in gauging the gravity of offense against a rule is the consideration of the consequences of the action. In this offense the woman is defiled in the body, in her emotional nature, in her affections, in her soul, to an extent and in a way which is not true of the man. In her case the consequences are conserved, transmitted. In his they come to an end. His offense may have a moral aggravation far beyond hers, or it may not. But the same offense it is not, nor can, nor ought, society to deal with her as with him. His penalty cannot be of the same kind as the one meted out to her. If he be threatened with that alone by well-meaning reformers, he can well afford to smile in their faces. Nothing is idler than the rhetoric about the injustice of the fact that she is cast out to shame and cold while he is received to club and drawing-room. This has always been society's method, and always will be. The fault has demonstrated her to be unfitted to discharge her social duty, while it has not conclusively shown his unfitness.

From this law of sexual purity for women, and the reasonableness of that law begins to appear. For them the law is

absolute chastity. No excuse or palliation will be admitted in the judgment of human society. God's judgments, we may well believe, will be in many instances different. He can heed the plea, "she sinned much because she loved much." But society cannot. There is too much at stake. In her person society itself is defiled by the offense, and is compelled in self-defense to visit upon her a penalty which does not fall upon her partner. This may be called hard, unjust, unfair, atrocious even, but that does not change the fact. Besides that, a closer examination of all the data would probably show that it is not open to these charges. At any rate, it is the way in which woman herself deals with her offending sister.

It is clear, therefore, that human society, presumably giving voice to the will of God, demands absolute continence (1), of all married men, under the penalty which attaches to a broken oath; (2), of all women, under the penalty which attaches to any act which brings confusion into the social structure; (3), of all married women, under the additional penalty of debauching posterity.

This leaves for consideration those men who have contracted no obligations, whose incontinence does not seem to them to carry with it any evil consequence, whom society does not severely punish, who find across their path only what seems to be an arbitrary prohibition. What will keep them continent? What ought to keep them continent? What has God, what has nature, to say to the young man here? There is no department of morals where it is as difficult to speak honestly. There is no place where conventional morality, both in its teaching and result, or lack of result of its teaching, is so unsatisfactory. When the young man is bidden, "thou shalt not commit adultery," he heeds. In all these cases he sees both the reason for the prohibition and the peril of the offense. But when he is bidden, "thou shalt not commit fornication," he heeds little. He knows that fornication is not adultery. The reasons for its condemnation are not so evident. They lie so deep down in the complex nature of things that he doubts their existence. The torment of an appetite which he knows to be "natural" drives him across a prohibiting line which he suspects to be "unnatural." The difficulty for him is intensified by the artificial conditions of the society in which he finds himself. In a simple social structure each man and each woman is mated early.

Physical appetite is transfigured by affection, and held in check by the responsibility of parentage. But each generation the average age of marriage is being pushed farther onward, and the percentage of unmarried men and women increases.

What shall the moralist, the physician, the priest say to these? It would surely be a great gain if they, all three, can say the same thing. To the unmarried American woman, little needs to be said. She is chaste by habit, by tradition, by pride, by instinct, by physical nature. She needs little exhortation. But what of the man? How many are continent between the ages of twenty and thirty-five? No man can say. Some are; probably far more than is often supposed. But more are not. They say when they speak at all on the subject, that it is "a counsel of perfection" to which they are not equal. They find no fault with the high demand which conventional morality exacts, but they regard it as impossible of attainment. What considerations will serve to give vigor to the young man's will by which he can bid his turbulent appetite come to heel? Christianity provides the supreme truth. It tells him that his body is the temple of a Holy Spirit. It warns him against defiling the temple of the Holy Ghost. It asks him if he will dare to "make the body of Christ the member of a harlot." There are thousands for whom this is sufficient. Their souls are inwardly reverent, and they compel their reluctant bodies to be at least outwardly respectful.

But there are tens of thousands to whom this is not sufficient. For various reasons, the spiritual dynamic of Christianity does not touch them. Has the law of purity any other hold upon them?

There would seem to be at least two facts which should bid them pause. The one is the peril to the body; the other is the peril to the soul. Let us not be misunderstood. We do not flourish threats of death to the body or of damnation to the soul. But there are a thousand ills which stop far short of either dissolution of damnation, which are nevertheless so grave that none but a fool will take chances with them. Fear may be a low motive, but the appeal to it is not unworthy. Indeed it probably is in point of fact the most common of guides. The man who buys sexual indulgence habitually, takes risks of bodily damage which none but a fool would incur. He imperils his subsequent life; the health of his wife who is to be; the life and self-respect

of his unborn children. Does he smile and say, "I'll take the chances?" Would it not be well for the experienced physician to say to him, "I have heard men say that; and I have seen them afterward, when they wished that they had died at least before they were damned."

There is another penalty, however, about which nature is inexorable. It is none the less natural because it happens to be a law of human nature. Why is pure lust not immoral in a beast? And why is it immoral in a man? Because in the beast it is not correlated with the affections, and in the man it is. "Making a beast of one's self" is not a metaphor. It is a scientific statement of a possibility. It is accomplished by eliminating the humane element from an act and thus reducing it to the deed of an animal. But this can only be done at the expense of the human part of nature. If it be done repeatedly, the humane element is injured. If it be done habitually, the humane element is destroyed. Nature is leisurely but unerring in her revenges. If one should then be counseled by a physician, who knows only the body, to "seek health by the temperate gratification of an appetite," he should be wise enough to object, "your advice would, no doubt, be wise if it were an appetite which had in it no quality but physical. Your prescription would be well for a beast; for a man it is not well." Incontinence of the body means deterioration of the soul. This would be just as true though the Bible had never been written, and though there were not a preacher of morality in the world. "The house of the strange woman opens unto death and her paths unto the dead." The soul which goes there sickens, and dies if it abides there. This is the price which nature fixes. Any cost of self-repression is cheaper. In this Solomon, Robert Burns, St. Paul, and the Great Physician agree.

I have not mentioned the crime of seduction in any of its forms. The man who is capable of taking advantage of youth, ignorance, inexperience, or of woman's love for the gratification of his lust; or the rare, but still existent, woman who plays and preys upon "the imperious instinct of man," are both alike beyond argument. They are condemned already.

Could hardly do so much for them, I ween."
"Who cast the devils from Gadarene,

—*Medical and Surgical Reporter*, Feb. 1, 1896.

# A CASE OF PAPULAR ERYTHEMA FOLLOWING VACCINATION.

By GEORGE HENRY FOX, M. D., of New York, Clinical Professor Diseases of the Skin, College of Physicians and Surgeons.

In the simple operation of vaccination it is possible to convey syphilis, leprosy, septicaemia, and, perhaps, tuberculosis, if due precaution is omitted. But the well-authenticated instances where even so common a disease as syphilis has been conveyed through vaccination are very few. The many evil results which are popularly ascribed to "bad virus" are due either to injury or irritation of the vaccinated part, to the accidental infection of the pustule, or to a personal idiosyncrasy, which leads to the development of a rash, such as sometimes follows the ingestion of certain drugs or articles of food.

Irritation of the vaccine vesicle may lead to severe dermatitis, cellulitis, and subsequent ulceration. Infection of the vesicle or pustule by atmospheric germs may induce erysipelas, furunculi, and contagious impetigo, which latter affection may be inoculated elsewhere by means of the finger-nails, and give rise to a pustular or crusted eruption, which is very apt to be mistaken for "generalized vaccinia."

The systemic reaction after vaccination may induce eruptions of varying types. These may appear before the development of the vesicle, but are most frequently met with when this is at its height. They may be erythematous, urticarial, purpuric, and even vesicular or bullous in character, but present no specific features which would indicate their vaccinal origin. These eruptions may depend upon some abnormal condition of the patient, in which case the vaccination cannot be regarded as the prime cause of the rash, inasmuch as it merely evokes an eruption which was already latent, and which might have appeared spontaneously, or from any one of a variety of causes. Frequently, however, the vaccinated subject is in normal health, and the vaccinal eruption, like a drug rash, can only be attributed to idiosyncrasy.

A not uncommon form of erythemato-papular eruption is illustrated in the following case:

In November last, I was asked to see a two-year-old child under the care of Dr. Pierson, of Morristown, N. J. The arm presented a well-developed vaccine pustule, drying into a blackish crust (ninth day). Around this were considerable redness and swelling, although there was no indication that the vaccine lesion had been injured or irritated in some way. The face was somewhat swollen, and spotted with a few irregular erythematous patches. The trunk was nearly covered with a bright red erythemato-papular eruption, which occasioned the infant considerable distress. The lesions consisted of pin-head-sized, folicular papules, mostly aggregated in small, rounded patches, and confluent upon the middle of the back, where the skin appeared red and smooth. The papules were numerous upon the palms, and there were a few upon the soles. Upon the extremities (except near the vaccine pustule) the eruption was by no means as copious as upon the trunk.

The eruption had appeared early in the morning of the preceding day (a week after vaccination), upon the vaccinated arm. In the evening it had developed upon the trunk. After a very restless night the eruption had become quite general, as already described. During this second day of the eruption the patches upon the trunk became smoother and less angry in hue, although they had increased somewhat upon the arms and legs. The skin was still hot and itchy, gentle rubbing of the back proving very grateful to the little sufferer. The temperature marked 103½°. The treatment consisted in a laxative dose of calomel and the application of a lotion containing oxide of zinc in lime water.

On the following morning the eruption was much smoother and paler. Some of the small discoid patches on the trunk presented a bright peripheral ring, with a dull-red or livid centre. Nearly the whole surface of the child's body was involved by the eruption, and the small areas of normal skin presented a strong contrast with the affected portion. The eruption faded rapidly, and the drying of the vaccine crust proceeded as though no rash had occurred.—*The Medical News, January 4th,* 1896.

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PATENT MEDICINE MAN: "Madam, did your husband use the bottle of Fakem's Balm for Life I left him?" Wife: "Yes. It took immediate effect." Patent Medicine Man: "Good. Then you can conscientiously say that he will use no other." Wife: "I'm quite sure of it. He's dead."—*New York World.*

# FILTRATION OF CITY WATER SUPPLIES.

## Abstract of an Argument for Filtration With Special Reference to Philadelphia.*

By EDWIN F. SMITH, C. E.

The Schuylkill River, at the time when it was first taken for the water supply of the city of Philadelphia, early in the century, flowed through a region heavily timbered with oak, pine and hemlock—an ideal source of supply. About one-sixth of its water shed (310 square miles) is north of the Blue Mountains, in a country not adapted to agricultural pursuits, and which, at that early day, was almost without human habitations. South of the Blue Mountains the valley of the stream widens, and its broad acres contain one of the most fertile agricultural regions of the State, embracing, above the city of Philadelphia, an area of 1,590 square miles, which, as early as 1800, was fairly well settled by a farming community.

From that day to this, the stream has been gradually changing in character. The discovery of anthracite coal at the head waters of the stream was colsely followed by the chartering of the Schuylkill Navigation Company, in 1815, and the building of dams and canals, for the creation of a slack-water navigation. An impetus was given to business of all kinds in the valley, and the little settlements grew to towns and cities. The woodsman's axe was busy, as, unfortunately, it always is in such a country, and in the first half of the century, sad inroads had been made in the noble forests bordering the "hidden river." From that period dates its deterioration.

The pollution of the river above Flat Rock Dam may be said to date from the year 1850. Prior to that, the towns were small and without sewers, and the manufacturing industries, even at Manayunk, had not grown to such a size as to perceptibly influence the purity of the river water. The volume of flow of the stream was large as compared with the inflow of polluted water, but the cutting off of the timber had already begun to effect a change in the flow, the floods becoming more destructive, and the periods of low water more protracted.

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*Journal of the Franklin Institute for May, 1896.

Viewing the Schuylkill as a water supply stream to-day, after a period of deterioration of nearly half a century, the change is very marked.

In 1850, there were thirty-two pools formed by the dams of the Schuylkill Navigation, on the 108-miles of river from Fairmount, at Philadelphia, to Port Carbon. These pools aggregated 48 miles in length, and if there is any merit in the theory of subsidence as a means of purification of water, they performed a part in holding back the mineral matter at the normal flow of the river. At the present time, there are nineteen dams in the river, the thirteen remaining ones above the Blue Mountains having been removed, and the river restored to its original channel and natural slope.

The effect of this change upon the water supply of the city of Philadelphia is easily understood. Prior to 1890 steam dredges were constantly at work in the pools of the upper river, removing the deposits of culm washed down from the anthracite collieries, and of sand and débris, resulting from the scouring of the banks of the stream and its tributaries after the cutting off of the timber.

Now, in this 20 miles of river, there is no agency at work to arrest the flow of coal dirt, but instead, when the river is in flood, the work of disintegration of the particles is hastened by the flow over the bed of an open river with considerable declivity. The presence of coal dirt is very perceptible, at Philadelphia, in the black water which comes in every freshet with what is called the second rise of the river.

Below the Blue Mountains, in the second division of the river already referred to, the floods bring down the yellow clays of the limestone regions in Berks and Montgomery Counties, the red shale of the lower tributaries of the Perkiomen and other streams, and the washings from the surface of an extended agricultural district. The chrome-yellow, and at times the reddish color of the water, is a sufficient indication to those familiar with these streams that the lower river is in flood.

These are the elements in the water supplied to the city for domestic purposes that cause discomfort to its citizens and provoke unfavorable criticism as to its purity. But however uncleanly it may be, and *unsuitable* for any domestic and manufacturing purpose, it does not follow that water impregnated with

pulverized anthracite coal and with earthly matter is dangerous to health. The unsightly water is not always impure, and the clear, sparkling water is not always a pure and safe one for drinking purposes.

There are, however, sources of pollution in every river flowing through a fertile and well-populated district like the Schuylkill Valley, which must be guarded against in some way, if the health of any community using the river for a domestic supply is to be preserved.

First and most important of these to Philadelphia is the pollution of the river within the city limits.

Much has been done by the city, since the year 1865, to prevent this. The creation of Fairmount Park, the improvement of the Wissahickon Valley, the building of the Mantua Creek sewer on the west side, and the Manayunk intercepting sewer on the east side of the river, the building of river walls on either side of Fairmount Pool—all at a great cost—are indicative of the desire of the people that everything possible should be done to protect and preserve the purity of the water supply. A few more sources of pollution might be removed at a very small cost, namely, the indiscriminate dumping of ashes and refuse into the river at Manayunk, and the flow of sewage through the sewers into Fairmount Pool, in cases where it has not already been intercepted.

Second, the pollution of the river by the towns and cities above Philadelphia.

This has not, up to the present time, been a serious matter, but it may become serious in the near future, unless preventive measures are used.

Seven cities and towns, namely: Reading, Pottstown, Spring City, Phoenixville, Norristown, Bridgeport and Conshohocken, with a total population of 110,000, pump daily (approximately) 11,500,000 gallons of water from the Schuylkill for domestic and manufacturing purposes. They are all equally interested with the city of Philadelphia in preserving its purity. Nevertheless, without the restraining arm of the law, exercised through a State Board of Health, as is done in Massachusetts, Connecticut and a few other States, the purity of the water cannot be preserved. With the multiplication of conveniences of living, and the introduction of modern water appliances into dwellings and public buildings, there comes the demand for sewers, to take the place

of cesspools and to carry off waste water. Sewers must discharge somewhere, and there is nothing so easy and apparently so economical in the eyes of a taxpayer as to empty them into the river.

Fortunately for Philadelphia, there has been very little of this evil up to the present time; but is on the increase, and, in the natural course of events, will grow very fast. Within a year the city of Reading, with a population of 72,000, has completed the sewerage system of its first district, covering about one-third of the city. The sewers, instead of discharging into the river, are connected with a sanitary sewage system, with a disposal plant, and arrangements for burning the excrement and refuse solid matter, and filtering the liquid through sand filter beds, before discharging the effluent into the rivers. Unfortunately, this system is not at the present time in use, the sewage being allowed to flow through a by-pass directly into the river. Few house connections have as yet been made; but as they are now allowed by the city authorities, the increase in number will be very rapid, and, therefore, in the interest of the towns on the river below, and the city of Philadelphia, it would appear to be wise to limit, in some way, the use of the by-pass. As a matter of ordinary prudence, it is best that crude sewage should be kept out of streams; it is, in fact, absolutely unsafe to allow it to flow into a stream which at any point below is the source of a public water supply.

I have indicated two urgent reasons why the city of Philadelphia should filter its entire supply from the Schuylkill, namely:

(1) To remove sedimentary matter, mineral and organic, and filth brought down by floods, so as to clarify the water and make it sightly and fit for domestic purposes.

(2) To remove, as far as possible, organic matter contained in sewage from cities and towns in the valley, which is a constant menace to the health of those obliged to use the water for drinking purposes.

No State in the Union has done more or better work in this direction than the State of Massachusetts, and its example might profitably be followed by Pennsylvania, to whose State Board of Health the Legislature so grudgingly gives inadequate appropriations.

To the State of Massachusetts we are indebted for the solution of two important questions in connection with the filtration

of a polluted water supply. I quote from the report of the Massachusetts State Board of Health, for the year 1894, as follows:

"(1) With properly constructed filters, which are carefully operated, at a uniform moderate rate of filtration (not exceeding 5,000,000 gallons per acre, daily), satisfactory hygienic results may be regularly obtained with the Merrimac River water.

" (2) The cost of rendering, by filtration, a polluted water supply safe for drinking purposes is considerably less than was formerly supposed to be the case."

These statements are based upon the experience gained in operating the sand-filter beds connected with the water supply of the city of Lawrence, Mass. In this connection it may be stated that the valley of the Merrimac is much more densely populated than that of the Schuylkill, and the problem of filtration is a more difficult one.

What is being done at Lawrence with the Merrimac River water can be done at Philadelphia with both the Scuylkill and the Delaware. Filtration is being carried on now throughout the city for both household and manufacturing purposes—and, in some instances, on quite a large scale. I submit the results of a chemical analysis of sand-filtered Schuylkill water drawn from the Market Street main, the filters having a rated capacity of 450,000 gallons per twenty-four hours. This examination is made disinterestedly for the purpose of following up and regulating the working of the filters, and of preserving a record of the condition of the water analyzed each month.

The results show the Schuylkill water to be not so bad as it has been represented to be; but, on the contrary, they prove it to be a safe drinking water, if properly filtered.

The question for Philadelphia is: What shall be done to preserve and enlarge its water supply? The city has even now reached a crisis, and is pumping, in seasons of drought, in excess of the ability of the river to furnish water. For twenty-seven years, since 1869, the question has been before successive administrations, and has been debated in Councils, only to be shirked and handed down to their successors.

I cannot hesitate, therefore, to express my conviction that a great mistake was made in the framing of the "Bullitt" Bill, upon which the present city government is based, in not vesting the control and management of the water supply in a Board of

Water Commissioners, instead of in Councils and a cumbersome "Watering Committee" of Councils. Such a board should be non-partisan, and limited in number to four or six members, equally divided between the two leading political parties, with power to use the surplus revenue of the department for the extension of the water works, when necessary.

It is interesting to note that the system of placing the management of water works in the hands of Councils and similar governing bodies does not find favor in the United States. It does not clearly fix the responsibility for the failure to provide for a matter of such public interest upon which the well-being and health of the community depends. Out of 225 public water works, embracing the principal cities and towns in United States in 1890-91, only 23 were so managed, the control of the remaining 202 being vested in a Board of Public Works, or a Board of Water Commissioners.

When will the City of Philadelphia awake from its long sleep? When will it throw off its lethargy and command those who are in power, and who could act if they would, to cease postponing action upon so vital a question?

Philadelphia, March 16, 1896.

The Secretary read the subjoined letter, received from Dr. Leeds:

The Secretary of the Franklin Institute:

Sir—I regret that my duties here will prevent my acceptance of your invitation to attend the meeting to-morrow evening and take part in the discussion upon the subject of filtration, with especial reference to the present needs of Philadelphia. Inasmuch, however, as I regard those present needs as imperative, I should be sorry to let this opportunity pass without urging the corresponding need of appropriate and corresponding action.

During the years 1881, 1882 and 1883 the city expended $125,000 in an elaborate investigation of the whole subject of a future water supply. The details will be found stated at great length in the reports of the Chief Engineer for those years, and also the conclusions arrived at, which were that recourse must be had either to some distant point, like the Delaware at Point Pleasant or even as far as the Water Gap; or if this were not done, that the present sources of supply should be purified by filtration. This was thirteen years ago, and the same recommenda-

tion has been made by the head of the Water Department during each succeeding year, and reiterated by the chemists of the Board of Health, the Academy of Medicine and by the citizens' associations. As chemist of the Water Department during the progress of the survey, I advocated the plan of not abandoning our present sources of supply, but of purifying them.

My reason for so doing was that the analyses and examinations showed that the Delaware River above Point Pleasant, or above the Water Gap, and the upper waters of the Perkiomen, the Lehigh River, the Neshaminy and the Tohickon were not entirely free from contamination. Even if recourse were had to these water sheds, there would come a time in the future when the water drawn from the best of them would have to be purified by filtration. I asked many city engineers in England why they maintained great systems of filter beds for water supplies, which, in their quality, were fully equal to that of the Delaware at Point Pleasant, or the Perkiomen above Zieglersville. They said that public opinion demanded a water supply which should at all times be free from color and sediment, and that the only practicable method of securing these ends was by filtration. The most noteworthy instance of this kind was in connection with the new supply of Liverpool. This is taken from Vyrny Lake, situated 40 miles away in the mountainous part of Wales, and filled with water so pure that it is customarily referred to by chemists as exhibiting a high grade of purity. The well-known engineer, Mr. Deacon, at that time in charge, on my expressing surprise that in case of water of this kind he should regard it necessary to establish along the line of conduit a system of filter beds, said that he was compelled to do so by force of public opinion.

The future filtering systems of Philadelphia should, however, be installed at present in connection with the present pumping stations. The water of the Elbe, at Altona, contains rarely, if ever, less than 10,000 bacteria per cubic centimeter, usually over 20,000, and frequently 40,000 or more. This, it will be acknowledged, is densely populated sewage-holding water; yet this fact did not prevent the Altona authorities from successfully filtering the Elbe water and thus escaping the cholera epidemic which so afflicted the neighboring but unprotected city of Hamburg. What 20,000 and 40,000 bacteria per cubic centimeter means, I can best illustrate by reference to the bacteria in the

Passaic River. This river receives the sewage of Paterson, and, at a point below, is pumped directly into the reservoir and mains of Jersey City. Ordinarily, at the point of intake, it contains from 7,000 to 13,000 bacteria, and yet this unfiltered water renders Jersey City the most subject to typhoid fever of any city in New Jersey.

Granting that a system of filtration should be established, the preliminary expenditure of $250,000 to settle upon the best system for such water as is supplied from the present intakes on the Schuylkill and Delaware, would be the best way to save money in the end. It would require many pages merely to mention the questions open to discussion, in attempting beforehand to decide upon the system which Philadelphia should adopt. The relative merits of "mechanical" and "natural sand" filtration have never been tested on a proper scale by filter plants operated upon and running side by side; neither has the relative cost of removing dirt and bacteria by means of alumina, oxide or iron or similar coagulant, in comparison with slow subsidence through sand only. The proper head of water in a gravity filter; the proper depth and character of sand; the relative merits of continuous and intermittent filtration; the advantage of aeration as an adjunct, etc.—all of these points can be properly settled, not by dicussion, but by actual trial. In 1883, the writer proposed the use of aeration as an adjunct to purification. It was first tried in connection with the Philadelphia water at the Corinthian Basin, and since that time, in one or another form, the aeration of the water has become a feature of water purification in many places. The city appropriated $10,000 for purchase of the aerating machinery, which might still be utilized if it has not fallen to decay in the meantime.

In conclusion, I would reiterate my often-expressed convictions that the only economically practicable way in which Philadelphia can be freed from the stigma of its present high typhoid death-rate is by putting in a system of water purification on some such lines as indicated above. Yours, very truly,

ALBERT R. LEEDS.

Stevens Institute of Technology, Hoboken, March 17, 1896.

MR. L. Y. SCHERMERHORN.—During the recent freshet in the Schuylkill River, extending from February 7th, at 7:30 A. M., to February 11th, at 12 M., or during 100 hours, I made

an approximate determination of the volume of water passing over the Fairmount Dam during this interval, and also the relative quantity of solid material held in suspension by the water, under the following conditions:

During the freshet the depth of water on the crest of the dam varied from 1.5 feet to 7.7 feet. The volume of water passing over the dam during the interval of 100 hours named, as calculated for the varying depths by accepted hydraulic formula, was found to be about 9,350,000,000 cubic feet. On February 9th, while the depth of water on the crest of the dam was about 2 feet, a sample of the city water was drawn from a house spigot and found to contain 1-1200 part by volume of solid material.

It will be noted that the volume of solid material was determined at a time when the freshet was below its average height, and after the water had passed through the reservoir, and some sedimentation had ensued; it is therefore assumed that the determination of 1-1200 part of solid material is a reasonable assumption to be applied to the entire volume of the freshet.

On such a supposition the volume of solid material carried by the freshet waters during the 100 hours named would be

$$\frac{9{,}350{,}000{,}000}{1{,}200} = 7{,}791{,}000 \text{ cubic feet,}$$

or about 290,000 cubic yards.

Assuming that the average daily quantity of water used by the city of Philadelphia is 220,000,000 gallons, or 29,300,000 cubic feet, and further, that this volume contained during the freshet the volume of solid material named, then in that event it was equal to

$$\frac{29{,}300{,}000}{1{,}200} = 24{,}400 \text{ cubic feet}$$

of solid mud contained in our water supply during one day of the freshet. An ordinary one-horse cart contains about 24 cubic feet; the above named volume of over 24,000 cubic feet of mud would fill at least 1,000 carts, and if placed in close file would form a line nearly three miles in length; if placed on Market Street, would form a line of carts extending from its foot to Thirty-sixth Street, West Philadelphia. What would the citizens of Philadelphia think if they really saw such a procession on its

way to our reservoirs with the intention to deposit such an amount of mud into our water supply for one day?

If my determinations have been reasonably correct, the Schuylkill River was, during the time named, doing what might have been done with no greater disadvantage or different results by the thousand carts loaded with mud.

MR. J. C. TRAUTWINE, JR., Chief of the Bureau of Water, took occasion to protest against the popular indiscriminate denunciation of members of Councils, which gives the impression that Councilmen, generally, are strangers to the taste of water, and are, therefore, indifferent to the needs of the city in this respect; whereas, even those who have been least hopeful of the passage of the pending ordinance have recognized, from the first, that there was a good working majority in favor of it, and have doubted only the possibility of obtaining the two-thirds vote necessary in cases which, like this, involve an appropriation.

He then presented a report of the results of investigations of the relative merits of sedimentation and filtration in clarifying and purifying water.

When this matter was first mentioned in Councils he shut off the smallest division of the East Park Reservoir, and proceeded to take samples from day to day, and to have them tested, bacteriologically and chemically, by Dr. A. C. Abbott, of the University of Pennsylvania. The results confirm those given by Dr. Percy Frankland in his "Micro-Organisms in Water." The first day's sedimentation left 637 out of 1,000 microbes in a given quantity of water, while the second day reduced this number to 131. From that time forward, during the remainder of the ten days through which the experiment was continued, the experiment showed but little change either way.

Filtration, on the contrary, effects the removal of 98, or more, per cent. of the bacteria.

These results were illustrated by means of the lantern, and samples were exhibited showing the raw water, and the effect of twelve days' sedimentation. The latter showed a slight improvement in the matter of clearness.

# MEDICAL EXCERPT.

By T. P. CORBALLY, A. M., M. D.,

CREOSOTE IN TUBERCULOSIS.—At a meeting of the Société Médicale des Hôpitaux, M. Catin, *(Le Progres Medical* of 14th March, 1896,) expressed the belief that injections of creosote are indicated in a very limited number of cases, and are contra-indicated in very many, especially in those that follow a devious course. It is useful in the early stages and in torpid cases, but not specific.

*M. Fernet.*—It is difficult to form a prognosis in tuberculosis, and to form a true idea of the value of the various treatments employed. Hygienic changes alone can effect a cure in tuberculosis cases that progress slowly. Creosote produces some disturbance in the digestive apparatus, also in the circulation and in the nervous system, but only in cases in which it is administered in sufficient doses; in other cases it produces phenomena of intoxication, and may lead to acute or chronic creosotesin. Creosote is a bactericide only when the blood is charged with a large dose. It is contra-indicated in alcoholic cases and in sclerosis of the arteries. In many cases large doses are dangerous. All methods of administration are admissible.

*M. Hanot* has observed in his cases of tuberculosis of the liver, that creosote causes the urobilin of tuberculosis patients to disappear. Rectal injections seem to be the most active.

*M. Le Gendre.*—Before the employment of creosote for tuberculosis, it was recommended in the treatment of some forms of dyspepsia. It may then prove of real use as an adjuvant in some gastric disorders.

*M. Hazem.*—Three facts may be emphasized as the result of this discussion: 1, the action of creosote on the digestive tract; 2, on urobilinuria; 3, the intestinal origin of this urobilin. For a long time past the German physicians have been accustomed to employ creosote in tabes of the digestive tract. It is certain, however, that in all the cases of tuberculosis in which creosote has been employed, the lesions of the stomach have been most marked. 2. The remarks of M. Hanot are very important, but it must not be forgotten that rest is sufficient, in many cases, to cause the removal of the urobilin. In regard to the intestinal

origin of urobilin, it will be remembered that the theory is already old. It should also be remembered that it is more abundant in the healthy individual. However, it is true that urobilinuria is not a physiological phenomenon.

*M. Barrie.*—In the greater number of cases of tuberculosis, creosote, given by the stomach, produces disturbance of digestion. He has given it by the rectum, and generally in suppositories.

*M. Ferrand.*—Creosote seems to act as an irritant. It is indicated in the torpid infiltrations of the lungs, when there is no congestive reaction. It should not be employed when the tubercles are dispersed in numerous small centres, with a tendency to soften. Creosote increases the acute congestions in the periphery of these centres.

*M. Manguat* called attention to the advantages of injections of an emulsion of creosote in milk, in the proportion of ten per cent. of creosote. It may be preserved for a long time, and it mixes perfectly with water, in all proportions.

*M. Burlureaux* supported the conclusions of M. Fernet: creosote is not a specific, but an adjuvant. It should be employed with care. All patients, however, who bear large doses well, do not recover.

*M. Siredey.*—The law proposed may have many exceptions. One of his patients took readily 2 grammes of creosote a day, yet died of acute tuberculosis.

*M. Faisans.*—It must not be concluded that the tolerance of creosote will ensure a favorable action of the remedy, and the practitioner should oppose the universal employment of creosote in all forms of tuberculosis; there are some in which it is certainly injurious.

ERYSIPELAS.—MM. Chantemesse and Saintas have sent to the Société Médicale des Hôpitaux a work on the erythematous and purpuric eruptions of erysipelas, reported in the *Gazette Hebdomadaire*, 15th March, 1896. There are some forms of these erythematous eruptions that are of a benign character, but the purpuric form is much more serious, and half the cases end in death; it is accompanied with albuminuria, articular pains, ataxo-adynamic phenomena, and hemorrhages of different kinds. The blood, the urine, and all the organs contain streptococci. .

The polymorphous erythema extends over the limbs, but does not usually attack the face, the back, nor the chest. The ery-

thematous patches are covered with vesicles, with bullae, filled with a sero-purulent or hemorrhagic liquid. Albuminuria soon appears, and hemorrhages from different sources. The patients who recover always retain on their limbs the indelible marks of the disease.

TEMPERATURE OF THE VISCERA DURING FEVER.—MM. d'Arsonval and Charin have made some very interesting experiments to show the temperature of the abdominal viscera during the course of fever from various causes, reported in the *Gazette Hebdomadaire*, 22d March, 1896.

The temperatures have been measured by passing needles through the viscera to be tested, and connecting them with a very sensitive galvanometer.

Among a number of animals in which fever was excited by the introduction into the system of various toxic agents as diphtheria, tuberculine, and the like, we have found that the liver was the centre of the excessive heat, which reached 142 cent., or 107.6 Fahr., while in the rectum it was 41.1 to 41.4 cent., or 106 to 106.3 Fahr.

These degrees were followed by temperatures decreasing in the following order: the spleen, the heart, the kidneys, the marrow of the bones, the brain, the lungs, the muscles, the skin. The kidneys having in a marked degree the temperature of the blood in the aorta, the brain, the lungs, the muscular tissue, and the skin being uniformly cooler.

These results agree, partly, with the conditions found in the normal state; indeed, it is generally found that the pathological condition is an exaggeration of that found in the physiological. Besides, these facts prove that the intensity of the heat developed during the course of the disease, and the activity of the preventive measures employed, are not the same in all the different zones; in this regard marked differences are found. The facts also show that, if the economy consists of a number of distinct centres, when considered from an anatomical, a clinical standpoint, etc., these distinctions are still met with in the differences of temperature, and these distinctions, which are the consequences of the intimate changes, become the causes of other accidents.

DOVER'S POWDER.—Dr. William Osler has recently recalled attention to the composition and efficiency of Dover's Pow-

der, as compounded and administered by Dr. Thomas Dover, a medical practitioner of London, a century and a half ago. Dr. Dover's formula was:

"Take opium, one ounce, saltpeter and tartar, vitriolated, each four ounces; ipecachuanha one ounce. Put the saltpeter and tartar into a red-hot mortar, stirring with a spoon until they have done flaming. Then powder them very fine; after that slice in your opium, grind them to a powder and then mix the other powders with these. Dose, from forty to sixty or seventy grains (4 to 7 grains each of opium and ipecac) in a glass of white wine posset before going to bed, covering up warm, and drinking a quart or three pints of the posset; drink while sweating. The modern and insufficient medium dose is ten grains.

An old physician, well known to us, and with whose practice we are acquainted, has been for many years, and continues to be, in the habit of using opium with or without ipecac, in acute inflammatory affections—grip, pleurisy, pneumonia, peritonitis, etc., —*when seen early*—in doses corresponding to those recommended by Dr. Dover, followed by quarter to half doses every hour and a half, if relief does not follow the first dose, with so much better results than the use of any other means that has fallen under his observation, or been accounted of by others, that he contends for the superiority of this treatment to all other treatments for such affections.

SUBACUTE AND CHRONIC INTESTINAL CATARRH. —According to Professor Escherich (Therapeutic Wochenschr. March 9, 1896), the characteristic element of chronic intestinal catarrh in children is the presence of an increased amount of mucus in the stools, while in other respects the latter resemble those of diarrhoea, being more fluid and frequent than normal, and containing undigested food particles. If the mucus comes from the upper portion of the intestinal canal it appears in the form of sago-like granules, intimately mixed with the remnants of food. If, however, the lower portion of the intestine be the seat of the catarrhal process, the mucus forms a colorless or yellowish green layer over the feces.

In the treatment of these cases of subacute and chronic enteritis, Professor Escherich during the past year employed tannigen, and with results far surpassing those formerly obtained by him from the customary astringents and bismuth preparations.

Even as early as the second day after commencing the administration of this drug the quantity of fluid and mucus in the stools was found markedly diminished, and in a few days more they had assumed a normal character. The drug must now be discontinued, so that no constipation will result. Of course, such a favorable and rapid course can only be expected in those subacute cases which in themselves tend to recovery and in association with dietetic remedies. Yet, even in chronic cases a diminution of mucus and firmer consistence of the stools is always apparent, at least at the beginning of the tannigen treatment. To obtain reliable results large doses are advised by the author; 0.25 Gm. to children up to one and one-half years and 0.5 Gm. to older children, four to six times daily. It is best given mixed with the food, and in that form is readily taken by the little patients. It is also of importance to note that no unpleasant after-effects as disturbance of the appetite or digestion were ever observed to follow its administration.

CHOLERA INFANTUM.—Dr. J. M. Duncan (Medical Brief, September 18, 1895,) says: "There is evidence of irritation here, manifest at both ends of the line. First, by the vomiting, and, second, the diarrhoea. What then are the indications?

"The answer is plain. First, control the irritation, and, second, remove the cause. To control vomiting, one-eighth grain tablet of calomel every hour until four are taken. Follow with teaspoonful doses of castor oil, or pure olive oil, in which is mixed three to five drops of Battle & Co.'s Bromidia, every two hours, until it operates on bowels, and be sure that it *does operate, too.*

"Then give every two or three hours from half to a teaspoonful, according to age and emergency, of the following: Aquae calcis, mistura cretae, syrup acaciae, of each 1 ounce; bromidia, ½ ounce; bismuth sub nit, 1½ drachms.

"M. Sig.: Shake well before using.

"Repeat the oil every morning *till it operates*, and follow it as before. If the bromidia in this formula is not sufficient to insure quiet and sleep, I give enough of it in addition till it does, always properly diluted. In extreme bad cases, with 'brain symptoms,' I depend entirely on bromidia, and it has never failed me. I have given it in half-teaspoonful doses every hour till the desired effect, with no unpleasant results.

"Observe proper rules of feeding and bathing and the little patient is usually all right in a few days. Since I have adopted and followed this course, now about twenty-five years, I have not lost a case of cholera infantum or summer diarrhoea, and my records will show that I have treated, probably, as many as any one in the same section of country.

"When doctors learn that medicines never cure any disease, but may only remove the cause, that the system may restore itself, then there will be a great revolution in our medical armamentarium, and the manner of using, to obtain the desired results."

VIN MARIANI.—The following letter, from Mavrogeny Pacha, Physician-in-Chief to His Majesty the Sultan, is but one of many to show the esteem in which distinguished physicians hold the well-known tonic wine "Vin Mariani:"

"Yildiz Palace,
"Constantinople, July 2, 1895.

"Sworn enemy of the proprietary medicines which have of late years inundated all countries, and whose only object is the acquisition of gain for the proprietors, without the least benefit to science nor to humanity, I make a single exception in favor of one preparation as meritorious, and which is thoroughly praiseworthy. I refer to 'Vin Mariani,' which, without guise of deceit and mysticism, is valuable in its fortifying qualities, and has conferred high benefits upon weak and suffering humanity.

"(Signed) Mavrogeny Pacha,
"Physician-in-Chief to His Majesty the Sultan."

During the past thirty-five years "Vin Mariani" has gained more ardent admirers among the medical profession throughout the world than any other preparation, and justly so, as there has never been a disappointment from its use. This is specially noteworthy on account of the attacks made from time to time against coca (generally from interested parties), and on investigation it is shown that the many so-called coca wines are nothing more than shameful mixtures of cheapest, inferior wines, and variable solution of cocaine unscrupulously sold as coca wine, simply for mercenary purposes.

It is in this manner that really useful drugs are brought into discredit.

M. Mariani has gathered the written opinion, clinical notes, etc., of many thousand physicians from all parts of the world, showing

the universal high opinion of practitioners who have subjected "Vin Mariani" to thorough test.

ANTIPHTHISIN.—Conclusions of New Orleans Antiphthisin Commission: In November, 1895, the Parish Medical Society of New Orleans, La., appointed a commission for the investigation and a public test of antiphthisin as to its value in tuberculosis, to be made in the Charity Hospital of New Orleans, the commission consisting of the following members: Dr. Edmond Souchon, President; Dr. A. J. Bloch, Secretary; Dr. J. D. Bloom, House Physician of Charity Hospital; Professor John B. Elliott, Professor R. Matas, Professor F. W. Parham, Dr. F. Loeber, Dr. Charles Chassaignac, Dr. John H. Bemis, Dr. Joseph Holt, Dr. H. L. Lewis, Dr. P. E. Archinard, Dr. O. L. Pothier, Dr. A. McShane, Dr. C. J. Landfried.

The treatment of cases began November 27th, and its final report was presented to the Parish Medical Society at its regular meeting, March 28th, 1896. The report is voluminous and will be published in full. The following are the conclusions arrived at:

*In Surgical Cases.*—A consideration of the three improved cases would certainly lead us to believe that antiphthisin has decided value, and we should commend its careful, tentative employment in such cases in conjunction with general measures, and the usual, appropriate surgical operative treatment. The glandular case we consider especially encouraging. This case would seem to have required a most serious operation for the removal of the glands, with great uncertainty of ultimate benefit. The improvement under antiphthisin treatment would alone justify us in ascertaining that we have in this remedy a most valuable aid in the management of such cases. We beg to call attention in this connection to the case of Dr. Ambler, of Ohio, reported recently in the New York *Medical Record*, as confirmatory evidence of the value of antiphthisin in glandular tuberculosis. The hypodermic employment of the remedy would seem to be especially advantageous, if administered under careful aseptic precautions.

*In Medical Cases.*—1. In nearly every case the area of lung involved decreased, if it did not clear up entirely.

2. Auscultation bore out the results of percussion, vesicular respiration replacing to a greater or less degree morbid breath-

sounds. In those cases which were classed as cured, the departure from health being only such as is due to the results of every continued pneumonic process.

3. Secretion was diminished even in the cases marked only improved, and entirely absent in others.

4. Bacteriological reports in most of the cases bore out the results obtained in physical and other examinations.

5. The general condition of the patients improved in the large majority of cases, even in those whose physical examination did not show any great improvement.

6. The use of the remedy was not attended with any danger to the patient.

7. Finally, Antiphthisin does seem to have *curative* and not simply palliative qualities.

PROPOSED RESERVATION FOR CONSUMPTIVES.—On March 24, Mr. Gallinger, of New Hampshire, presented petitions and papers from medical men, clergymen, and educators to the United States Senate in favor of setting apart a Government reservation for the benefit of persons in the North suffering from pulmonary diseases, who might be benefited by a change of climate to the salubrious atmosphere of the Rocky-Mountain region. He subsequently introduced a bill setting apart the Fort Stanton Military Reservation in New Mexico.

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"The medical profession of the United States and other English speaking countries, has long held the well-known firm of Reed & Carnrick, manufacturing chemists, in high esteem. Their name has been synonymous with honesty and integrity; the conduct of their great business has been such that no one could take exception to it. They have been most careful to maintain and strengthen the traditional dignity and conservatism of the profession. They have been large advertisers, but always through legitimate channels. They are a standing reproach to concerns that employ unprofessional and unworthy methods of advancing their business interests, and stamp their false pleas for so doing as wilfully mendacious. Reed & Carnrick is one of those firms who have always maintained in word and act the ability of the profession to support, and well support, those manufacturers of pharmaceutical products, who are worthy of countenance."—*The Alabama Medical and Surgical Age.*

# EDITOR'S TABLE.

## Sanitarian, May Number, 1896.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

### THE CENTENARY OF JENNER'S DISCOVERY OF VACCINATION.

E. DJENNEROME VAKZINAZII.
1796—1896.

*O Chetvovanii vi Reussie, 2-14 Maia, 1896, Goda.*

On the 2d-14th of May, 1896, a hundred years will have elapsed since Dr. Edward Jenner publicly vaccinated from arm to arm with humanized vaccine.

The results following the discovery of Jenner have been a very useful means of preserving the health of the public against the ravages of that terrible disease known as small-pox. The discovery of Jenner may be said to have formed the basis that led to the discovery of other remedies as preventive agents against contagious diseases.

The centenary of Jenner's discovery, this triumph of human genius, which has had such a powerful influence on the development of preventive medicine, ought to be celebrated by the Scientific Societies in every country in the civilized world.

The Russian Society for the preservation of public health will celebrate, with the encouragement of the Emperor, the centenary of the discovery in the following manner:

I.—A consensus will be opened, for which four prizes will be offered for the best works or studies on vaccination.

II.—With the assistance of the government, of provincial and municipal institutions, of learned societies, and of physicians, the Council of the Society will collect all the facts and documents relating to the history of the development of vaccination in Russia, and will publish the same.

III.—A translation of the works of Jenner into Russian will be published for the anniversary.

IV.—The Society is engaged in organizing an exhibition of such objects as relate to vaccination.

V.—A general and formal meeting will be held on the centenary of Jenner's discovery.

UESLOVIIA KONKURSA.

The following studies will be accepted for this consensus:

1. Whatever relates to the general question of small-pox and vaccination.

a. Vaccination as a means of prevention.

b. The history, medico-geographical and medico-statistical, of small-pox and vaccination.

c. Clinical studies, pathologico-anatomico, bacteriological, chemical, and others, relating to the question of vaccination as a means of protection.

d. Publications intended to popularize the advantages of vaccination against infection.

2. Regarding the methods of vaccination.

a. Reports and studies on the preparation and perfecting of vaccine, and on its preservation, etc.

b. Improvements in instruments used in vaccinating men and animals.

c. Model establishments for vaccination.

II. Studies on these subjects will be received in Russian, French, German, and in English; they may be printed or be in manuscript. Books or pamphlets printed before the 2d of May, 1894, will not be received.

The time for the reception of all documents ends on the 2-14 of May, 1896.

III. The members of the jury will be elected by the council of the society.

The names of the successful essayists will be printed in the principal journals.

IV. The names of the authors may be placed on the essays, or a device, which will also be placed in an envelope containing the name and address of the author, may be used.

V. The first prize will consist of a gold medal and a thousand roubles; the second, a gold medal; the third, a small gold medal, and the fourth a silver medal.

The honorary President of this work will be His Royal Highness Prince Paul Alexandrowitsch. The wonder is that Russia should be the foremost in celebrating an act so deserving of public recognition.

T. P. C.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA.—*Mobile*, 31,076: J. A. Abrahams, M. D., Health Officer, reports for February: Deaths, 62—19 under five years of age. Annual death-rate, 25. Vital and mortuary statistics for the year 1895: Births, 910, of which number 495 were white and 415 were colored. The ratio of births per 1,000 inhabitants was 29.28. Tables following in due order will furnish much further valuable information in relation to the vital statistics of the city. The total number of deaths was 915, of which 422 were white and 493 were colored. Basing a calculation upon the last census the death rate was 29.44. The principal causes of death were as follows: Typhoid fever, 22; malarial fever, 48; dysentery, 16; diarrhoea, 8; phthisis pulmonolis, 132; pneumonia, 48; violent deaths, 42. The highest mortality was 101 in September; the lowest was 55 in February. Of the 915 deaths there were 252 under 5 years of age and 5 over 100 years old at the time of death.

March 14, *Smallpox* was reported in the city—a second case. Compulsory vaccination was decided upon and undertaken. *Tuscumbia* was also much exercised over a case of *Smallpox* reported in that city March 31. The case was that of a negro, in a house near the Memphis & Charleston repair shops, almost in the central portion of the city, and up to several days ago had been visited by a large number of his colored friends, one of whom slept with him, and has been waiting on him.

*Selma*, 7,622. John A. McKinnon, M. D., registrar, reports for February: Deaths, 10. Death rate, 13.10.

CALIFORNIA.—J. H. Davison, M. D., President, Los Angeles; J. R. Laine, M. D., Secretary, Sacramento. The Secretary reports for March, 59 urban localities, aggregating a population of 742,995; deaths, 106,985; pneumonia, 85; bronchitis, 42; diphtheria (and croup), 11; measles, 11; typhoid fever, 4.

*San Francisco.*—A. S. Lovelage, M. D., Health Officer, submits an imperfect report—omitting the estimate of population and annual death rate—"of work done by the previous administration, they having failed to render their report before retiring from office"—for this fiscal year ending June 30, 1895: Deaths, 6,057, classified as follows: From zymotic diseases, 539; constitutional, 1,477; local, 3,129; developmental, 574; violent deaths, 337; unascertained, 1. Of the zymotic diseases, the chief causes of death, were, from typhoid fever, 123; diphtheria (and

croup), 48; cerebro-spinal meningitis, 39; diarrhœal diseases, 359. Of the constitutional: Consumption, 1,080; bronchitis, 247; cancer, 289; rheumatism, 26. Of the local: Apoplexy, 202; heart diseases, 475; pneumonia, 492; nephritis, 112. Of developmental, atrophy, inanition, etc., 270.

For the month of March, 1896, Dr. Lovelage reports: Population, 330,000; deaths, 528—113 under five years of age. Death rate per 1,000 for the month, 1.60. The chief causes of death were consumption, from which there were 87 deaths; from pneumonia, 50; heart diseases, 62; cancer, 30; apoplexy, 28; nephritis, 20. From zymotic diseases, 34; typhoid fever, 6; diphtheria (and croup), 4.

*Los Angeles*, 100,000: Deaths, 132—26 under five years of age; annual death-rate, 15.84. Deaths from specific infectious diseases, 27; from phthisis, 17; tuberculosis, 12; consumption, 29. Phthisis and tuberculosis, without explanation, are synonymous.

COLORADO.—*Denver*, 150,000: William P. Munn, M. D., Health Commissioner. Deaths in March, 132; from *phthisis*, 29; 1 contracted elsewhere. Annual death-rate, 10.57.

The county hospital is reported (Denver Times, March 14) badly infected with typhoid fever. The victims at present are Drs. Gardiner, Shippey, and Delahanty; the chief head nurse, Miss Kloth; eight training school nurses, two porters, and two laundresses; and Dean Clark, son of Superintendent Clark. The cause of the trouble has not yet been discovered. The new garbage contractor is prosecuting her work with vigor, is heartily sustained (Rocky Mountain News, March 25) by the health authorities and the public, and the prospect is a cleanly city.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. A. Lindsley, M. D., Secretary, New Haven. The Secretary's *bulletin* for March comprises reports from 167 towns in the State, from which the number of deaths reported for the month was 1,288. The death rate for the larger towns is 17.1; for the smaller, 18.3, and for the whole State, 18.9. Deaths from zymotic diseases, 156—12.1 per cent. of the total mortality. These were chiefly from measles, 36—20 in Hartford; diphtheria (and croup), 43—7 in Bridgeport; 5 each in Naugatuck, New Haven, and New London—from consumption, 141; pneumonia, 217; bronchitis, 53.

*Hartford.*—Report for the year 1895 (Times, March 24), 60,000: Deaths (no. not stated); death rate per 1,000, 17.21. Deaths from zymotic diseases, 196; diphtheria (and croup), 32; typhoid fever, 35; diarrhoeal diseases, 94. From consumption, 101; heart diseases, 74; kidney diseass, 56. Cases of infectious diseases reported, 425, as follows: typhoid fever, 160; diphtheria, 141; scarlet fever, 124; measles, 75.

DELAWARE.—E. W. Cooper, M. D., President, Camden; E. B. Frazer, Secretary, Wilmington.

*Diphtheria* is epidemic in Milton.

*Wilmington.*—Dr. Joseph P. Pyle, Dr. John C. Fahey, J. Harvey Spruance, and George B. Ward have been appointed members of the Board of Health to succeed those whose terms expired May 1st. Dr. Willard Springer, port physician, and Chief Engineer James Wilson are also members of the board by virtue of their respective offices. Attention is invited to the health ordinance requiring medical attendance in cases of infectious and contagious diseases to report in writing to the secretary of the Board of Health within six hours after the diagnosis in such case or cases, occurring between 6 o'clock a. m. and 6 p. m.," etc., etc. The ordinance further gives the Board of Health power to adopt such means of quarantine as in their judgment the health of the city may require. Any person failing to report a case in any of these diseases a fine of $15 is imposed, and anyone failing to observe the quarantine can be fined $20.

DISTRICT OF COLUMBIA, white, 187,600; colored, 87,900: 275,500. W. C. Woodward, M. D., Health Officer, under date of March 21st, reports that—

The rise in the death-rate week before last was followed by an additional rise last week. The deaths reported to the health department numbered 130, as against 121 in the preceding week. Correspondingly, the death-rate advanced to 24.5 from 22.8 per thousand inhabitants. The principal diseases causing this mortality were those of the lungs, brain, heart, and kidneys. Nearly one-third of all the deaths were due to maladies of the lungs, of which 19 were from pneumonia and 17 from consumption. Brain disorders caused 16 deaths, those of the heart 15, and of the kidneys 5. These results were probably due, in part at least, to the continually severe weather. The mean temperature of the week was as low as 37°, while there was a barometric mean of but

29.9, with a high mean relative humidity of 79. The zymotic diseases were represented by six deaths from measles, one from typhoid fever, two from diphtheria, and one from whooping cough.

Of diphtheria, 8 new cases were reported, 2 houses were removed from quarantine, and 23 remained in quarantine.

At a meeting of the Board of Trade, attended by many physicians, February 25, a series of resolutions was adopted urging efficient measures for the protection of the water supply and such improvements of the sewerage of the city as would effectually prevent the disgraceful prevalence of typhoid fever and other infectious diseases due to the pollution of water, foods, and soil throughout the city. Dr. Busey spoke of the interest manifested in typhoid fever, because it illustrated best the evils which should be corrected. This disease, as is well known, is, he said, due to the bacilli in water and milk. He spoke of the fallacious notion that typhoid fever was the result of some other fever. If there is a case of typhoid fever, he said, it was that from the first. He exhibited diagrams showing the conditions in cities with and without sewers, the former presenting favorable conditions, especially where there was a fair or good water supply, and the latter exhibiting a high death rate in proportion to the improvement of the sewer conditions.

He especially emphasized the fact that one-third of the houses without sewer connections furnished more than one-half of the cases.

Dr. Busey spoke especially of the figures giving the number of consumers of well water or spring water. In whatever way these figures are looked at, he said, there was only one conclusion, and that was, the deaths were caused by polluted water.

Dr. Busey's remarks were endorsed by Drs. Kinyoun, Johnson, and others. Surgeon-General Sternberg considered the water from the standpoint of a bacteriologist. He said that a glass of water might contain a large number of bacilli, but the results of taking such water into the system varied with the susceptibility of the individual, and also the virulence of the bacilli. Some persons could drink with impunity water that would be dangerous to others.

Capt. D. D. Gaillard, U. S. A., who is in charge of the aqueduct, spoke in an interesting way of the cost of filtration systems,

speaking especially of what he called the natural method and the mechanical.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Health Officer, Jacksonville. The Secretary's *official bulletin* for March summarises the statistics from 45 counties and 5 cities, exclusive of Jacksonville, Tampa, and Osceola, with an aggregate population of 391,122: Births, 446; marriages, 539; deaths, 264—73 under five years of age. Annual death rate, 8.01. The chief causes of death were: from consumption, 45; pneumonia, 23; dropsy, 11; meningitis and paralysis, of each, 8; burns, old age, and tetanus, of each 6.

*Tampa.*—20,000: Dr. J. W. Douglass, City Health Officer, reports for the month of February: Deaths, 36—16 under five years of age; annual death rate, 20.59. No prevalent disease; from typhoid fever and puerperal fever, two deaths each; of other diseases, only one each.

*Pensacola*, 15,000: Deaths reported for March, 26—7 under five years of age. Death rate, 19. No prevalent disease.

*Jacksonville's* report, as published in the newspapers from month to month, is devoid of useful information, e. g. March 19: "The city physicians submitted their reports, showing that during the past two weeks 75 patients were treated, in addition to the 29 that remained from the time that the last report was made. Of the total, 69 were discharged, 1 died, and the others are still undergoing treatment."

Such reports are suspicious; they suggest that there are causes of disease which the authorities do not wish to become known.

GEORGIA.—*Atlanta*, March 18: The Board of Health was busy yesterday preparing for the enforcement of the new law requiring all marriages and births in the city to be reported. Mayor King will sign the amendment to-day, and the matter will become a law.

ILLINOIS.—William E. Quine, M. D., President, Chicago; J. W. Scott, Secretary, Springfield.

*Chicago*, 1,600,000: William R. Kerr, Commissioner, reports for March: Deaths, 1,988—752 under five years of age. Death rate for the month, 1.24; for the year ending March 31, 14.76. Prevailing causes of death and the numbers: from diphtheria, 75; typhoid fever, 65; consumption, 235; other tubercular diseases, 43; pneumonia, 260; bronchitis, 152; heart diseases,

111; nephritis and other diseases of the urinary system, 87. Cases of contagious diseases reported: diphtheria, 251; scarlet fever, 79; typhoid fever, 10. Of 126 cases of diphtheria treated with antitoxin, 91.27 per cent. recovered.

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M. D., Secretary, Indianapolis.

*Indianapolis*, March 28: Dr. J. N. Hurty is making some radical changes in the usefulness of the State Board of Health. He is having prepared circulars for the better care of food and for combating typhoid fever. It is to be hoped that regular reports of the sanitary condition of the State will speedily ensue.

INDIAN TERRITORY.—Independence, Kan., March 28: Traveling men and persons who have come up through the Indian Territory within the last few days report that the people are greatly aroused over the spread of smallpox, which is raging in different parts of the Territory, and that all the towns along the Missouri Pacific railroad from Coffeyville to Fort Smith, Ark., are quarantined.

IOWA.—Frederick Becker, M. D., President, Claremont; J. F. Kennedy, M. D., Secretary, Des Moines.

*Des Moines*, March 13: Dr. Walton Bancroft, of Keokuk, has been appointed by Governor Drake to succeed Dr. Frederick Becker, whose term of office expired January 31. Dr. Becker will be greatly missed from the board. During the seven years he was connected with it he was earnest, efficient, conscientious, and faithful in the discharge of every duty.

*Bulletin* for April has miscarried.

KANSAS.—T. E. Raines, M. D., President, Concordia; T. Kirkpatrick, M. D., Secretary, Westphalia.

*Topeka*, March 24: The eleventh annual report of the State Board of Health has just been printed. It contains almost two hundred pages. The Secretary reports that the health of the people of the state has been remarkably good during the past year, and county health officers report less sickness than usual.

He says some very pointed things about some of the state institutions, particularly the Industrial School for Girls at Beloit, as follows:

"There is a moral wrong with this institution, as well as with the reform school at Topeka. There are inmates in both of these institutions that are guilty of no crime, yet they are sent there

by parents, guardians, and officials simply because they are in the way and they want to get rid of them. It is criminally wrong to place an innocent child in these places, where they are compelled to daily associate with some depraved girl or boy sent there for crime.

"The sewerage of the school for the deaf and dumb, at Qiathe, I found very defective—sewer gas in quantities in all parts of the building; water supply only fair."

KENTUCKY.—Joseph M. Matthews, M. D., President, Louisville; J. N. McCormack, M. D., Secretary, Bowling Green.

*Harrisonsville* is reported, March 12, to be afflicted with epidemics of measles and typhoid fever. The schools have been forced to discontinue work. More than 100 cases of fever and measles have been reported in this locality within the past three months.

LOUISIANA.—S. R. Oliphant, President, New Orleans; W. R. Harnan, M. D., Secretary, New Orleans.

*Smallpox* is reported, March 31, at Pointe Coupée March 27, and at Wilson and other points along the railroad March 30. New Orleans report for March appears to have miscarried.

MAINE.—C. D. Smith, M. D., President, Portland; A. G. Young, M. D., Secretary, Augusta.

*Augusta.*—At the annual meeting of the State Board, March 30, Dr. C. D. Smith was unanimously re-elected president. Secretary Young reported on a visit during the winter to Pittsfield to advise the local Board of Health in connection with proper places for cutting ice supplies for local consumption, and the results of a visit to Bar Harbor in connection with a malignant outbreak of fever, which terminated in the latter part of December. Prof. Robinson reported that favorable progress had been made in his work for the board of determining the disinfecting value of formic aldehyde and in devising a lamp for the generation of formic aldehyde gas.

*Portland*, 40,000: Secretary Dyer, of the Board of Health, reported March 27: Deaths for the four weeks ending March 21, 76—15 under five years of age. Annual death rate, 24.75. Prevailing causes of death: pneumonia, 12; consumption, 7; bronchitis, 4; heart diseases, 5.

*Bangor* Board of Health reports March 16th for the year ending January 1, 1896: Deaths, 380. Death rate, "*about* 15 per

1,000"—population not given. There occurred during the year 7 cases of diphtheria, with 4 deaths; 27 cases of scarlet fever; 55 cases of typhoid fever, with 13 deaths. Considerable progress has been made in sewerage and the connection of house drainage therewith, and proportional extinction of privy vaults and earth closets.

MARYLAND.—John Morris, M. D., President, Baltimore; James A. Steuart, M. D., Secretary, Baltimore.

*Baltimore*, 496,315—73,747 colored. James F. McShane, M. D., Health Commissioner, reports for March: Deaths, 703—190 colored. Annual death rates, W., 1,461; C., 3,211: 1,700. Deaths from infectious diseases, 41; consumption, 83; pneumonia, 114; influenza, 18; bronchitis, 24—231, or 32.86 per cent. of the total were under five years of age.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

*Boston*, 501,083: S. H. Durgin, M. D., Chairman. Deaths in February, 928—266 under five years of age. Annual death rate, 22.22 per 1,000. From diphtheria (and croup), 52; typhoid fever, 6; consumption, 22. Cases of contagious diseases reported for the month: diphtheria, 403; measles, 109; scarlatina, 99; typhoid fever, 19.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for March: Compared with the average for corresponding months in the ten years, 1886-1895, pleuritis was more prevalent, and intermittent fever, consumption, diarrhea, remittent fever, and erysipelas were less than usually prevalent in March, 1896. Including reports by regular observers and others, consumption was reported present in Michigan in the month of March, 1896, at 242 places, scarlet fever at 72 places, measles at 55 places, typhoid fever at 43 places, diphtheria at 40 places, whooping-cough at 23 places, and smallpox at 7 places. Reports from all sources show consumption reported at twelve places less, typhoid fever at two places less, scarlet fever at six places more, diphtheria at eleven places less, whooping-cough at five places less, measles at twenty-five places more, and smallpox at two places more.

*Detroit*, 250,000: Samuel P. Duffield, M. D., Health Officer, reports for March: Cases of infectious diseases, 102; diphtheria, 40; scarlet fever, 33; chicken-pox, 11; typhoid fever, 10; small-

pox, 3. Deaths reported, exclusive of 33 still-born, 440—68 under five years of age. Death rate, 16.29.

The Board of Health has decided to concede Dr. Baker, the State Health Board's Secretary's, demand for full and detailed annual reports of all contagious diseases in this city, and Inspector Fitzgerald was instructed to write up the reports.

MINNESOTA.—Franklin Staples, M. D., President, Winona; C. N. Hewitt, M. D., Secretary, Red Wing.

*Minneapolis*, 225,602: H. N. Avery, M. D., Health Commissioner, reports for February: Deaths, 155—44 under five years of age. Deaths from diphtheria (and croup), 5; typhoid fever, 5; consumption, 20. Death rate, 8.96.

*St. Paul*, 140,292: Alexander J. Stone, M. D., Commissioner, reports for March: Deaths, 115—37 under five years of age. Annual death rate per 1,000 was 9.86. Deaths from diphtheria (and croup), 5; typhoid fever, 3; consumption, 12.

*Duluth.*—Health Officer Routh has compiled statistics of typhoid fever in this city (Duluth *Commonwealth*, April 4) as follows:

During the year ending March 31, '96, there were 2,020 cases of the disease reported, of which 1,662 were in houses supplied with city water, and 358 in houses supplied with well water. Deaths numbered 153.

In '95 the cases were 691—544 city water and 147 well water; deaths, 74.

In '94 cases numbered 502—403 city water and 99 wells; deaths, 62.

In '93 cases were 367—278 city water and 89 wells; deaths, 36.

In '92 there were 749 cases—604 city water and 145 well water; deaths, 73.

The number of fatal cases was 7.5 per cent. of the whole number. The number of cases reported was 3 per cent. of the whole population. The number of deaths was 3 per cent. of 7.5 per cent. of the population, or very nearly one-fourth of one per cent. That is 25 in every 10,000.

Report for the month of March: "Typhoid fever appears to be dying out."—(!)—*There were but 40 cases and 12 deaths.*

MISSISSIPPI.—*Jackson*, March 24: The new State Board of Health met here to-day and organized by electing the following officers: W. G. Kiger, of Vicksburg, President; John F. Hunter,

of Jackson, Secretary; Executive Committee, J. F. Hunter, H. H. Haralson, and W. G. Kiger. The smallpox question was discussed at length, and all county health officers ordered to report instanter any infectious or contagious diseases prevailing in their localities.

*Ellisville*, March 30: Several new cases of smallpox were reported by the city physician this morning, and a meeting of the citizens and Board of Aldermen was called this afternoon at 4 o'clock. There are up to this time four cases of genuine smallpox and about three of vaerioloid.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Willis P. King, M. D., Secretary, St. Louis.

*St. Louis*, 570,000: M. C. Starkloff, M. D., Commissioner of Health, reports for March: Deaths, 811—225 under five years of age; from diphtheria (and croup), 26; phthisis, 117. Annual death rate per 1,000, 17.07.

*Kansas City*, 150,000: R. P. Waring, M. D., Health Officer, reports for February: Deaths, 166—39 under five years of age. Death rate, 13.28. From diphtheria (and croup), 7; consumption, 10; pneumonia, 15; bronchitis, 9.

NEBRASKA.—J. V. Beghtol, M. D., President, Friend; F. D. Haldeman, M. D., Secretary, Ord.

*Omaha*, 140,000: S. R. Towne, M. D., Health Officer, reports for February: Births, 140; deaths, 83. Cases of contagious diseases, 19.

NEW HAMPSHIRE.—G. P. Conn, M. D., President, Concord; Irving A. Watson, M. D., Secretary, Concord.

*Concord*, 19,000: Health Officer Palmer reports for March: Deaths, 35; death rate, 14.5, followed by a summary of the death rates for the preceding six years, which gives an average of 18.12. the lowest being, in 1891, 15.22, and the highest 22, in 1893. There appears to have been a somewhat singular exemption from infectious diseases. During the month of February, however, there were 10 cases of diphtheria, 4 of scarlet fever, and 1 of measles. In March, 1 of typhoid fever and 4 of measles.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

*Hudson County—Jersey City* and vicinity, 338,671: Report for February: Deaths, 629—269 under five years of age; from diph-

theria (and croup), 43; from typhoid fever, 35; from consumption, 49; bronchitis, 43; pneumonia, 118. Annual death rate per 1,000, 26.7.

*Drinking Water* has at last become a subject of public consideration for the people of Jersey City. But there is reason to fear, judged by the prevailing sentiment at a meeting of the Good Government (not good water) Club April 9, that there are some people so much more interested in the means of supply than they are in its purity, that the public may be persuaded for economic (?) reasons that water known to be abominably polluted, like that of the Passaic, filtered, is preferable to that which is thoroughly protected from pollution. Such, indeed, was the argument of one of the most prominent speakers at the meeting referred to. He professed to believe, and pretended to show, that the public health of 50 cities supplied with polluted water that had been filtered, was better than that of 50 other cities supplied with water from a pure source. He talked glibly about the percentage of typhoid fever being largest in cities furnished with water from a pure source. Unfortunately, there appeared to be no one present sufficiently thoughtful to ask him to name the cities of his reference, or to cite examples. On the contrary, his audience for the most part swallowed his filthy argument as they have been accustomed for years to swallow the polluted water of the Passaic.

Filtration is a useful means of removing all suspended matters from water, but shallow, indeed, must be the comprehension of any one who does not know that polluted water is ever liable to hold matters in solution that are not always oxidizable and dangerous to health, and that an essentially bad water cannot be changed into a wholesome water by any process of filtration, no matter how constructed.

*Newark*, 215,725: Health Officer Lehlbach reports for the four weeks ending April 18: Deaths, 348—117 under five years of age; from diphtheria, 9; consumption, 57. Annual death rate, 20.92.

NEW YORK.—Daniel Lewis, M. D., President, Syracuse; B. T. Smelzer, M. D., Secretary, Albany.

*Bulletin* reports for February: Deaths, 9,825, and an estimated death rate of 18.75. The relative infant mortality and the relative zymotic mortality were both the same as in January, but higher

than in the corresponding month of 1895. The average mortality under the age of five years for the past ten years has been 31.0 per cent. of all the deaths, against 30.0 this month, and the zymotic mortality 13.27 per cent., against 12.91 this month. The actual number of deaths reported from Cerebro-spinal fever, Typhoid fever, and Whooping Cough are a little less than in January, while those from Diphtheria are much less (440 against 530), while from other zymotic diseases there is no material variation. The only disease of this class which shows a materially greater mortality than in February of last year is measles, which continues its increased prevalence in the eastern part of the State. Scarlet fever has been reported from 51 localities, against 46 in January; Diphtheria from 31, the same as in January and December; Typhoid fever from 28, against 21 in January and 34 in December, the largest distribution being in the Hudson Valley district. One case of Smallpox, which has since proved fatal, has been reported from Rye. Consumption caused a small relative increase of mortality over January (11.75 per cent., against 11.28), as did also acute Respiratory diseases (20.50 per cent., against 19.80), but from these latter there were 500 fewer deaths than in February, 1895, when an epidemic of Grippe was at its height; the present epidemic of that disease continues, as noted last month, exceedingly mild, and may be estimated to have caused not to exceed 500 deaths. There are indications of the continued prevalence of jaundice as noted in January. The weather was characterized by excessive precipitation (an average of 5.10 inches), with a large number of cloudy days, the mean barometer being 29.89, mean relative humidity 80 per cent., temperature average for the month of 23 degrees F. and northwest winds of considerable velocity.

*New York City*, 1,995,000: Deaths, 3,379—1,218 under five years. Death rate, 21.26. Zymotic diseases, per 1,000, from all causes, 129.30; diphtheria (and croup), 187; typhoid fever, 17; consumption, 415; acute respiratory diseases, 720.

A special inspection of tenements recently made, to see that the halls were properly lighted, resulted in the discovery of about 8,000 violations of the health ordinance.

In 1,800 instances the proper appliances for lighting were not provided. The landlords were directed to put these in immediately. Violators of this law are liable to a fine of $50 in each instance.

*Brooklyn*, 1,100,000: Deaths, 1,853—680 under five years. Death rate, 21.00 From zymotic diseases per 1,000 from all causes, 144.65; diphtheria (and croup), 130; typhoid fever, 11; consumption, 67; acute respiratory diseases, 449.

Commissioner Emery issued a timely circular in April with regard to the dust-bearing tubercle-bacilli and other disease germs, but it was much less strictly observed during the moving season than it should have been. Indiscriminate spitting on the floors of the cars and ferry boats has been somewhat abated, but so long as meats and vegetables are permitted to be displayed on the side walks throughout the city, and thus exposed to the dust of dried manure commingled with that of dried sputa and all other sorts of filthy dust swept by the winds, for people to take with their food, it will be difficult to show the benefit of such discrimination.

*Buffalo*, 335,709: Deaths, 297—84 under five years. Death rate, 11.12. From zymotic diseases, per 1,000 deaths, from all causes, 126.70; diphtheria (and croup), 20; acute respiratory diseases, 42; consumption, 43.

*Rochester*, 160,000: Deaths, 140—26 under five years. Death rate, 14.30. From zymotic diseases, per 1,000 deaths, from all causes, 14.30; consumption, 28; acute respiratory diseases, 12.

*Albany*, 100,000: Deaths, 172—42 under five years. Death rate, 21.00. From zymotic diseases, per 1,000 deaths, from all causes, 14.30; typhoid fever, 12.

*Elmira*, 37,500.—Under date of March 27, 1896, Prof. Olin H. Landreth, of Union College, Schenectady, reported the results of his investigation of the Water Supply in its relation to the epidemic of typhoid fever to date, as follows, in abstract:

There are five sources of water involved.

(a)—Hoffman's creek storage reservoir. (Impounding resorvoir).

(b)—Chemung river at intake opposite pumping station of water company.

(c)—Ground water entering the collecting gallery opposite pump station.

(d)—New York State Reformatory reservoir. (Impounding reservoir.)

(e)—Private wells throughout the city.

The number of cases of typhoid fever reported from January

1, 1895, to March 14, 1896, was 392. An examination of the cases in relation with the water used shows that, although only 48 per cent. of the population of the city use the Chemung river water regularly, and probably not more than 55 per cent. use it at all, that this 55 per cent. furnished 65 per cent. of the typhoid cases in 1895; 93 per cent. of the typhoid cases in January, 1896; 90 per cent. of the typhoid cases in February, 1896, and 70 per cent. of the typhoid cases in March, 1896.

Seventy of the cases used well-water only, and all the rest used the Chemung river water in part. The conditions of the soil and bad drainage roundabout show liability, at least, to pollution of the wells. But, considering the relatively small proportion of cases among those who used the well water exclusively, as compared with all the rest who used the Chemung supply more or less, and considering, moreover, the sources of pollution of the Chemung river discovered, the evidence is abundantly sufficient to show that the chief, if not, indeed, the only, source of the epidemic was the polluted water of the Chemung river.

No typhoid bacilli have been discovered in any of the water. But—

"This examination of the polluting territory immediately on the Chemung and its two principal tributaries, within fifty miles above Elmira, shows:

1.—Over 40,000 people in cities and villages immediately on the river, with a much larger number having

2.—Over 5,000 people having direct public sewer connection to the river, with a much larger number having less definite river connection.

3.—Over seventy cases of typhoid fever during 1895, in the cities and villages visited, which include less than seventy-five per cent. of the village and city population immediately on rivers tributary to the Chemung, above Elmira.

4.—At least six cases of typhoid fever during 1895 occurring on premises sewered directly to the rivers, with a still larger number at premises having less definite but equally direct connection with the river.

Over ninety-five per cent. of cases of typhoid fever reported occurred after the beginning of low water in the rivers in 1895, and the statistics were taken to include a period of time as far back as the beginning of 1895, with the idea that the excreta or

infecting bacilli from cases early in 1895 might easily be detained in privy vaults, cess-pools, or stagnant pools in the streams, and only be brought down stream at the first strong freshet in the fall, which, this winter, occurred late in December, with no rise of the river of any consequence since the spring of 1895. The result of this examination of the polluting territory would seem to be that the actual infection of the river water from numbers of typhoid fever cases during 1895 was beyond question; any correction to the above census by giving greater time would almost certainly increase, rather than decrease the number of cases found and the opportunities for infection."

Considering such conditions and such results, the non-discovery of typhoid bacilli is of little importance.

Yet a report has reached us that the responsible parties for this supply of polluted water are pleading justification, that it was not for them to know that sewage was in continuous process of being discharged into the river at several places above the intake of the water they were delivering, under a contract they had entered into, "to supply pure and wholesome water for drinking and domestic purposes to the citizens of Elmira."

Surely nothing could be clearer than the duty of these contractors to practice vigilance over the supply, and in case it became polluted or unwholesome from any cause whatever, to correct it. But they chose, not only to neglect vigilance, but to be purposely blind to notorious conditions, and, moreover, they wholly ignored the exposure made by the Board of Health. In short, they persisted in poisoning the people systematically, even after their action had been demonstrated. They deserve trial for manslaughter.

NORTH CAROLINA.—George G. Thomas, M. D., President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

March *Bulletin* summarizes the reports of 79 counties for February. The principal diseases, named in the order of their greater prevalence, were measles, pneumonia, whooping-cough, typhoid fever, influenza, bronchitis, and mumps. The mortuary statistics for the month, of an aggregate population of 27 towns, 87,772 white and 62,913 colored: Deaths, respectively, 130 and 119, and death rates, 17.8 and 22.5. The chief causes of death were: Consumption, 50; pneumonia, 43; measles, 24; heart disease, 19; from other diseases, 1 to 11.

OHIO.—S. P. Wise, M. D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

*Cincinnati*, 350,000: J. W. Prendergast, M. D., Health Officer, reports for February: Deaths, 577—179 under five years of age. Death-rate, 19.78 per 1,000. From diphtheria (and croup), 13; typhoid fever, 22; consumption, 70; pneumonia, 66.

*Cleveland*, 330,279: J. L. Hess, M. D., Health Officer, reports for March: Deaths, 449—164 under five years; from diphtheria (and croup), 18; typhoid fever, 19; consumption, 39; pneumonia, 53. Death-rate, 16.01.

*Toledo*, 122,760: J. T. Woods, M. D., Health Officer, reports for March: Deaths, 122—12 under five years; from diphtheria (and croup), 45; typhoid fever, 23; consumption, 7; pneumonia, 8.

PENNSYLVANIA.—Pemberton Dudley, M. D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

*Smallpox.*—The Secretary reports that since February 20, 1896, smallpox has been reported at Maltby, Luzerne County, two cases, no deaths; at Priceville, Lackawanna County, one case, no death. The case previously reported at Brookville, Jefferson County, proved to be rhus poisoning.

*Cerebro-spinal meningitis* at Philadelphia, one case, no death; at Catasauqua, Lehigh County, one case, one death; at Allentown, Lehigh County, four cases, three deaths; at South Bethlehem, Northampton County, two cases, two deaths.

*Diphtheria* at Philadelphia, 558 cases, 174 deaths.

*Scarlet Fever* has prevailed extensively in a coal township, adjoining the borough of Shamokin, Northumberland County. The population of this township is about ten thousand, principally miners. Cases reported from July, 1895, to March, 1896, 202, with 60 deaths.

*Philadelphia*, 1,188,793: Theodore B. Stulb, Health Officer, reports for four weeks ending March 28th: Deaths, 2,001—708 under five years of age. Death-rate, 22. Deaths from diphtheria (and croup), 90; typhoid fever, 16; consumption, 234; pneumonia, 311.

*Pittsburg*, 275,000: Report for four weeks ending February 29th: Deaths, 465—165 under five years of age; typhoid fever, 16; consumption, 45; pneumonia, 97; bronchitis, 35. Death-rate, 21.6.

*Reading.*—The Board of Health reports for the year 1895: Population, 71,000; marriages, 796; births (exclusive of 135 pre-

mature and stillborn), 1,739; deaths, 1,091—443 under five years of age. Death rate, 15.36. The chief causes of death in the order of their greater prevalence were: From pneumonia, 193; consumption, 98; heart diseases, 98; diphtheria (and croup), 87; convulsions, 79; apoplexy, 62; typhoid fever, 34.

RHODE ISLAND.—A. G. Sprague, M. D., President, River Point; Gardner T. Swarts, M. D., Secretary, Providence

Contagious reported by *bulletin* for February: Diphtheria, 76; scarlatina, 97; typhoid fever, 17. Monthly average of these diseases respectively for the year 1895, 80, 84, 37.

Deaths reported for January, 573. From communicable diseases, including 71 tubercular, 218.

SOUTH CAROLINA.—J. R. Bratton, M. D., Chairman, Yorkville; H. D. Fraser, M. D., Secretary, Charleston.

*Charleston*, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for four weeks ending March 28th: Deaths, 157—109 colored. Under five years, 53; deaths from consumption, 33. Annual death rates, white, 21.73; colored, 39.04.

TENNESSEE.—J. D. Plunkett, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

*Bulletin* of March 20th reports that the principal diseases, named in the order of their greater prevalence, in the State, for the month of February, were: Lung diseases, acute, measles, la grippe, typhoid fever, consumption, whooping cough, malarial fever, scarlet fever, rheumatism, mumps, chickenpox, smallpox, diphtheria, meningitis and croup.

*Smallpox* in the State for the month ending February 29th: In Memphis, 19 cases, all colored. In Shelby County, 58 cases; 5 white and 53 colored, with 5 deaths resulting. In Fayette County, 3 cases, all colored, with 1 death. In Obion County, 3 cases; 2 colored and 1 white. From the town of Mason, Tipton County, there have been reported 27 cases, all colored. The first case occurred in a tramp family—origin obscure; thus making a total of 110 cases (6 white and 104 colored), with 6 deaths, in the State for the month of February.

In other States: At Hirshaw, Ari., at Middletown, Conn., at Cairo, Ill., at Duquoin, Waukesha County, Wis., at several points in Pennsylvania, at Seymour, Ind., at New Orleans, La., at Detroit, Mich. In Arkansas it is extensively diffused.

*Memphis*, 55,923—white, 28,064; colored, 27,859. J. J. McGowan, M. D., Secretary of the Board of Health, reports for the month of March: Deaths, 95—41 colored. Death-rates, white, 21.81; colored, 18.95: 20.39. Contagious diseases reported during the month: Smallpox, 22; scarlet fever, 7; diphtheria, 1.

*Nashville*, 87,754—white, 54,595; colored, 33,159. N. G. Tucker, M. D., Health Officer, reports for the year 1895: Deaths, 1,816, an increase over the preceding year of 295. Of these 842 were white and 974 colored, showing an increase of deaths, the whites 106 and the colored 189. The deaths under five years of age were 512, white 195, colored 317; as compared with the preceding year, during which 507 deaths under five years of age were reported, white 222, colored 285, a decrease in the whites and an increase in the colored. Death-rates, white, 15.42; colored, 29.37: 20.69. Chief causes of death were: Consumption, 300; pneumonia, 207; heart diseases, 76. There were 321 cases of scarlet fever during the year, with 26 deaths.

UTAH.—*Salt Lake City*, 48,076: William T. Dalby, M. D., Commissioner, reports for March: Deaths, 43—7 under five years of age; from pneumonia, 6; old age, 6; consumption, 4. Death-rate, 7.37.

VERMONT.—C. S. Caverly, M. D., President, Rutland; J. H. Hamilton, M. D., Secretary, Ritchford.

The State Board is reported to have held an animated meeting at St. Albans March 19th, at which the Secretary reflected somewhat severely on the physicians of that city, charging them with neglect of duty in not reporting cases of infectious diseases to the Health Officer.

"There had been reported, he said, 120 cases of measles, one of scarletina and one of diphtheria, but he knew that there were more. He was satisfied that the physicians generally did not do their duty and assist the Health Officer, and knew that it was not possible to do good work until they did. He did not know of any place in the State where the matter was so poorly and carelessly managed as St. Albans, and wanted the doctors to understand that they must report contagious diseases to the Health Officer or the law would be enforced regardless of who the physician was."

In reply to this, the physicians at a meeting of the Medical Club, week later—

"*Resolved*, That we protest that the action of the Secretary of the State Board of Health, Dr. J. H. Hamilton, in calling a meeting in this village and scoring the physicians for neglect in enforcing the health laws, was entirely uncalled for and unjust, and we feel that the Secretary of the State Board of Health has laid himself open to our most active condemnation and censure."

It is to be hoped, at least, that this contention may be followed by effectual sanitary work in the State, of which there is a singular lack of evidence hitherto.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; U. O. B. Wingate, M. D., Secretary, Milwaukee.

The right of the State Board to enforce the vaccination rule has been denied by the Circuit Court of Rock County, and the questions involved will now be passed upon by the State Supreme Court. The Circuit Court holds that the Board of Health has no authority to make any rule which in effect would contravene the State law requiring children to attend school.

*Milwaukee*, 255,000: Walter Kempster, M. D., Commissioner, reports for March: Deaths, 313—111 under five years of age. Annual death-rate, 14.73 per 1,000. Deaths from diphtheria (and croup), 26; typhoid fever, 4; consumption, 55; pneumonia, 36; bronchitis, 15.

Cases of infectious diseases reported: Diphtheria, 43; scarlet fever, 14; typhoid fever, 4.

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SOME GENERAL STATISTICS.—The 71 races inhabiting the world communicate with each other in 35,004 different tongues, and confess to about 15,000 religions. The number of men and women is nearly equal, the average longevity of both sexes being only thirty-eight years, about one-third of the population dying before the age of seventeen. Moreover, according to the most careful computation, only one person in 100,000 of both sexes attains the age of one hundred years, and only six to seven in 100 the age of sixty. The total population of the earth is estimated at about 1,200,000,000 souls, of whom 35,214,000 die annually—i. e., an average of 98,848 a day, 4,920 an hour, and 67 a minute. The annual number of births, on the other hand, is estimated at 36,792,000—i. e., an average of 100,800 a day, 4,200 an hour, 70 a minute.

Generally, taking the entire world, married people live longer than single, and those who have to work hard for their living

longer than those who do not, while also the average rate of longevity is higher among civilized than uncivilized races. Further, people of large physique live longer than those of small, but those of middle size beat both.

DIVORCE AND SUICIDE.—According to Dr. Enrico Morselli, divorced persons are particularly liable to commit suicide or to become mad.

Note these rather curious statistics. In Prussia there are, for every million of inhabitants:

Sixty-one suicides of married women, 87 suicides of young girls, 124 suicides of widows, 348 suicides of divorcees or women separated from their husbands, 286 suicides of married men, 298 suicides of bachelors, 948 suicides of widowers, and 2,834 suicides of men who are divorced or separated from their wives.

In Würtemberg we find for every million inhabitants:

One hundred and forty-three lunatics among the married women, 224 lunatics among the young girls, 338 lunatics among the widows, 1,540 lunatics among the divorcees or women separated from their husbands, 140 lunatics among the married men, 236 lunatics among the bachelors, 338 lunatics among the widowers, and 1,484 lunatics among the men who are divorced or separated from their wives.

This figures give matter for reflection to those who find the bonds of matrimony too heavy.

CURIOSITY IN LONGEVITY.—A remarkable instance of longevity in one family has just been published in the *St. Thomas' Hospital Gazette*. Mrs. B., born 1630 (five years after the accession of Charles I.), died March 13, 1732. She was tended in her last illness by her great granddaughter, Miss Jane C., born 1718, died 1807, and Miss Sarah C., born 1725, died 1811. A great niece of one of these two ladies, Mrs. W., who remembers one of them, was born in 1803, and is at the present time alive and well. It will be seen from the above facts that there are three lives only to bridge over the long period between 1630 and 1896, and that there is at present living a lady who personally knew Miss C., who had nursed a relative born in 1630. The last lady of this remarkable trio is hale and hearty, and has just successfully undergone an operation for cataract.

PUBLIC HEALTH OFFICERS IN GERMANY must hereafter possess a practical knowledge of mental disease. The Min-

ister of Education has issued an order which provides that candidates for this office will be required to attend a course of lectures on psychiatry at a German university and to attend the practice of a lunatic hospital for six months, or to hold office as interne of such a hospital for three months. A hospital in which such lunacy practice is taken out must not have fewer than one hundred and fifty mental cases yearly. The order comes into force in October of the present year, and it will apply to all candidates who are not already in their last year of study.

DR KOCH'S TUBERCULIN DENOUNCED.—Berlin, March 15.—Dr. Koch's tuberculine was fiercely denounced at a meeting of the Balneogic Society last week. Professor Liebereich declared that tuberculine had been discredited by all physicians, even veterinary practitioners, as its use was directly dangerous. Dr. Hausemann said that a greater percentage of lung diseases had been cured by allowing nature to help itself than by the treatment of experts. The debate arose on the report that Dr. Koch is preparing a new publication in advocacy of tuberculine.

WHAT THE NATIONS EAT.—A statistician compiled the following figures, showing the cost of nourishment for the various nations: The average Englishman consumes $250 worth of food per year; Germans and Austrians, $216 worth; Frenchmen, $212; Italians, $110, and the Russians only $96 worth of eatables per year. In the consumption of meat the English-speaking nations are also in the lead, with 128 pounds of meat a year per capita of the population; the Frenchman using 95 pounds; Austrians, 79; Germans, 72; Italians, 52; Russians, 50. The consumption of bread is reversed, being compared to that of meat. The English use 410 pounds a year; the Frenchmen, 595; the Austrians, 605; Germans, 620; Spanish, 640; Italians, 660; the Russians, 725.

SANITARIUM FOR NEGRO CONSUMPTIVES.—Dr. L. A. Scruggs, one of the colored physicians of the South, is the leading spirit in a movement to establish a sanitarium for colored consumptives at Southern Pines, N. C. The health reports of one Southern city having a mixed population are quoted by the doctor as showing the number of deaths from consumption to be 3,119. Of that number it is claimed 2,508 were negroes.

Fifteen thousand dollars will be required to establish the sanitarium, and it is proposed that the control of its affairs shall be

vested in a board of trustees equally apportioned between North and South.

Dr. Scruggs was graduated from Leonard Medical College at Raleigh, N. C., and was one of the brightest men of his class.

SACREDNESS OF PROFESSIONAL CONFIDENCE.—The recent case in England in which a physician was compelled to pay heavy damages for violating professional confidence, leads an English secular paper to comment upon the salutary lesson of this trial. It says that one of the great safeguards of society is that physicians should receive and deserve absolute confidence from those who consult them. "Our doctors are deep in the secrets of life." "It is very much to be desired that some authoritative assurance on their part that they realize the sacredness—for there is no other word that fitly describes it—of the relation between physician and patient, should be given to an alarmed public." It proceeds to say that the profession must now see that the British people will never pardon any betrayal on any pretext whatever of what is communicated to them "under the seal." Even if the law undertook to oblige doctors to betray patients in the cause of justice, the doctor who defied the law would be supported by public opinion, and raised to the dignity of a hero and martyr.

## OBITUARY.

DR. CHARLES N. METCALF died of pneumonia March 10 at his home, in Indianapolis, Ind. Dr. Metcalf had not been in the best of health for several years, but it was only on the —th instant that he became so ill that he had to take to his bed. He was born in Herkimer County, New York, April 25, 1846. His youth was spent on a farm. His early education was received in the country schools. He was a graduate from Fairfield Academy, at Fairfield, N. Y., and afterward entered the medical department of Michigan University at Ann Arbor. After his graduation he moved to Eaton Rapids, Mich., where he began practice. After a residence there of three years he moved to Indianapolis. In 1877, while at Eaton Rapids, he was married to Miss M. C. Montgomery. Dr. Metcalf was a member of the Odd Fellows, the Masons and the Elks. He was nominated by the Democracy of Marion County for coroner in 1878, but was defeated.

He was appointed secretary of the Indiana State Board of Health in 1883, a position which he resigned recently, his resignation to take place on May 1st.—*Indiana Medical Journal*, April 1896.

## NEW BOOKS AND BOOK REVIEWS.

THE INTERNATIONAL MEDICAL ANNUAL and Practitioner's Index for 1896. Edited by a corps of thirty-seven department editors—European and American—specialists in their several departments. 728 octavo pages. Illustrated. $2.75. E. B. Treat, publisher, 5 Cooper Union, New York.

The fourteenth yearly issue of this valuable one-volume reference work is at hand, and it richly deserves and perpetuates the enviable reputation which its predecessors have made for selection of material, accuracy of statement, and great usefulness. The corps of department editors is representative in every respect. Numerous illustrations, many of which are in colors, make the "Annual" more than ever welcome to the profession as providing, at a reasonable outlay, the handiest and best yearly résumé of medical progress yet offered.

Few annuals have acquired such extensive popularity with the medical profession as this, doubtless because each succeeding yearly volume is filled with entirely new matter, the gist of all that is deemed worthy of permanent record from the field of medical culture for the year, collated by a corps of contributors chosen with reference to their qualifications as specialists in the several departments into which the work is divided.

Part I., comprises the new remedies, together with an extended review of the therapeutic progress of the year.

Part II., includes a number of recent articles by eminent authorities: "How to Determine the Parasite of Malaria," "The Diagnosis of Toothache and Neuralgia," "The Remedial Value of Cycling," "Sensory Distribution of Spinal Nerve Roots," "Angio Neurosis," "Life Insurance," and "Röntgen's Method of Shadow Photography," illustrated.

Part III., comprising the major portion of the book, is given to the consideration of new treatment. It covers 500 pages and is a retrospect of the year's medical and surgical progress.

The fourth, and last part is made up of miscellaneous articles, such as "Recent Advances in Sanitary Science," "New Inven-

tions in Instruments and Appliances," " Books of the Year," etc.

The arrangement of the work is alphabetical, and, with its complete index, makes it a reference book of rare worth.

In short, the " Annual " is what it claims to be—a recapitulation of the year's progress in medicine, serving to keep the practitioner abreast of the times with reference to the medical literature of the world.

DIAGNOSIS AND TREATMENT OF DISEASES OF THE RECTUM, ANUS, AND CONTIGUOUS TEXTURES. —Designed for practitioners and students. By S. G. Gant, M. D., professor of diseases of the rectum and anus, university and woman's medical colleges, lecturer on intestinal diseases in the Scarrett Training School for Nurses, rectal and anal surgeon to All-Saints, German, Scarritt's Hospital for Women, and Kansas City, Fort Scott, and Memphis Railroad Hospitals, to East-Side Free Dispensary, and to Children's and Orphans' Home, Kansas City, Mo.; member of the American Medical Association, National Association of Railway Surgeons, the Mississippi Valley Medical, the Missouri Valley Medical, and the Missouri and Kansas State Medical Associations, etc., etc. With two chapters on " Cancer " and " Colotomy " by Herbert William Allingham, F.-F.R.C.S.Eng., surgeon to the Great Northern Hospital; assistant surgeon to St. Mark's Hospital for Diseases of the Rectum; surgical tutor to St. George's Hospital, etc., etc., London. One volume, royal octavo, 400 pages. Illustrated with 16 full-page chromo-lithographic plates and 115 wood-engravings in the text. Extra cloth, $3.50 net; half-Russia, gilt top, $4.50 net. The F. A. Davis Co., publishers, 1914 and 1916 Cherry street, Philadelphia; 117 West Forty-second street, New York; 9 Lakeside Building, Chicago.

A singularly comprehensive work on a too much neglected subject, by both patients and practitioners, insomuch that the cure of the diseases of which it treats is rendered proportionally more difficult by delay of treatment. Yet, as well stated by the author, happily for the sufferers, no other class of complaints succumbs more readily to judicious and, in the majority of cases, to simple treatment, when properly applied at the outset of the disease.

The work is admirably systematic. Every subject is so dis-

tinctly classified as to admit of ready reference. The illustrations are new and excellent.

It contains two important chapters that are entirely new in works on this subject, namely: "Railroading as an Etiological Factor in Rectal Diseases," and "Auto-Intoxication, or Auto-Infection, from the Intestinal Canal."

In short, it is the *par-excellence* work on "Diseases of the Rectum, Anus, and Contiguous Textures," for the general practitioner and student as well as the specialist.

In point of excellence of press-work, paper, binding, and particularly the handsome chromo-lithographic plates, it is in the highest degree creditable to the artists and publishers.

THE PRIMARY FACTORS OF ORGANIC EVOLUTION. —By E. D. Cope, Ph. D., member of the United States National Academy of Sciences; professor of zoology and comparative anatomy in the University of Pennsylvania. 12mo., pp. 563. Illustrated, Price $2. Chicago: The Open Court Publishing Company.

A virtual analysis of the mass of facts accumulated by biologists with regard to organic evolution, with particular reference to the animal kingdom, but on the lines of paleontologic research rather than the oecologic—the relations of organisms to one another—followed by Darwin and his followers, on the lines of Weismann, derived from the facts of embryology. On these lines "the attempt is made to show what we know, rather than what we do not know," and especially from the mass of facts recently brought to light in the field of paleontological research in the United States, and the evidence they contain interwoven with that derived from other sources. The author assumes that every variation in the characteristics of organic beings, however slight, has a direct efficient cause. This assumption, he holds, is sustained by all rational and philosophical considerations, and that any theory of evolution which omits the explanation of the causes of variations is faulty at the basis.

The work is divided into three parts: I., "The Nature of Variation;" II., "On these Grounds the Author Classifies His Work under the Comprehensive Headings;" "The Nature of Variation;" "The Causes of Variation, and the Inheritance of Variation." These subjects are severally considered in terse sections, showing such a thorough comprehension of the liter-

ature of the whole subject, in conjunction with a large amount of experimental knowledge, as to render the work alike commendable to both biological savants and tyros.

THE PSYCHOLOGY OF ATTENTION.—By Th. Ribot, professor of comparative and experimental psychology in the Collége de France. *Third edition.* Pp. 128. Cloth. Price 75 cents. Chicago: The Open Court Publishing Company.

We are gratified to observe the third edition of this book in so short a time, since we took occasion to say of the first, less than two years ago: "A book of educational value to all who would understand the mechanism of thought and learn how to apply it most effectually."—And who would not?

YE THOROUGHBRED —By Novus Homo, Three Interviews. First: "Man as an Animal;" second, "Man as a Magnetic Battery and an Electro-Telegraphic Machine;" third, "Man Americanized, the Great Republic, its Status, Dangers and its Future. 12mo., 128 pages, popular edition, heavy paper covers, 50 cents. Extra edition bound in fine cloth $1. The Health-Culture Company, publishers, 30 East Fourteenth street, New York.

This is an ultra book on the popular fad of heredity, which would hold one's ancestors or collateral relatives responsible for his own sins and make saints of vile reprobates. The subjects named in the title are considered by the author in the form of three interviews between Senior and his friend Juvenis. In the first interview Senior pretends to show how far short of being a thoroughbred is the average human being and the causes of this degeneracy. He dwells on the great necessity of more attention to the physical conditions of life for the preservation and perfection of the race. The second interview shows considerably more knowledge of electricity than of physiology. Clairvoyancy, hypnotic conditions, spiritism, mind reading, thought transference, etc., will prove interesting to those who have in any way followed the work of the Society of Psychical Research on these subjects. The third interview considers the potent factors that have produced the Americanized man, who is justly considered far from being as good as he should be physically or morally, and is in great need of grooming. The author has evidently not read Galton, or he would have more faith in the average man and

be less hopeful of what he might be under selection of the fittest for breeding purposes.

COCOA AND ITS THERAPEUTIC APPLICATION.—By Angelo Mariani. Illustrated. *Third edition.* New York: J. N. Jaros, 52 West Fifteenth street.

A handsomely illustrated description of the natural history of the cocoa plant and of its hot-house culture in France, together with an account of its therapeutical properties, and of the various medicinal preparations made from it.

TENTH AND ELEVENTH ANNUAL REPORTS OF THE BUREAU OF ANIMAL INDUSTRY. for the years 1893 and 1894.—By D. E. Salmon, Chief of the Bureau, Washington: Government print.

This report is exclusive of the scientific investigations published in bulletins that were issued during the interval, but comprehends important papers on anthrax, together with the results of efforts for its prevention in Australia by means of Pasteur's method of vaccination; on the extirpation of the disease of horses known as maladié du coït; the prevalence of tuberculosis among cattle in New York; injuries to cattle from swallowing painted objects; preliminary investigations of unknown disease in turkeys; black quarters; actinomycosis, or lump jaw; Australian meat trades. and miscellaneous notes.

THE NATURAL ARSENICAL WATERS OF LA BOURBOULE —By A. M. Brown, M. D., with an introduction and notes by Guy Cadogan Rothery. London: Sanitary Publishing Company, 5 Fetter Lane, E. C.

A pamphlet of thirty pages, describing the natural history of this water, its chemical properties, and therapeutic indications, found to be chiefly useful in scrofulous, herpetic and arthritic diatheses, and in the tertiary forms of syphilis.

## CONTEMPORARY LITERATURE.

### RÖNTGEN'S RAYS.

Among the many sources of light which we have at our disposal the most interesting of all is undoubtedly the Geissler tube, A glass tube, sealed at both ends, after air has been pumped out of it as much as possible, and having at its end two platinum wires, sealed through the glass, which are brought in connection

with a source of electricity. This is the simplest form of what is known in physics as a Geissler tube, or, in its perfected and modified forms, as a Hittorf's or a Crookes's tube, or simply as a vacuum tube. When its two wires are connected with the two poles of an induction coil, or with the two electrodes of an influence electrical machine, the most striking luminous effects are obtained. A stream of luminous matter, partly composed of minute particles of metal torn off the negative pole (cathode), rushes towards the other pole, and where it meets it, or where it strikes the glass, a beautiful glow is produced, especially if the glass is such as to become easily fluorescent. And beautiful as these effects are in their simplest form, they may be embellished and diversified almost infinitely by varying the nature and exhaustion of the gas with which the tube was filled, the shape of the tube itself, and the nature and the shape of the electrodes, while the study of the intimate nature of the luminous emanations which proceed from the cathode—the so-called "cathode rays"—opens an immense field of investigation into some of the most arduous problems of physics. . . .

Lenard wrote in December last, the cathode rays depend in their absorption upon the mass of matter they traverse. They do not behave like light, but like a cannon-ball which is arrested in its course by the density of the heap of earth which it has to pierce. Moreover, while usual luminous vibrations would take no hold of a magnet placed near their path, the cathode rays explored by Lenard were deflected by a magnet from their ordinary rectilinear directions. And yet—such is at least Lenard's opinion—the magnet acted not upon the rays themselves, but upon the medium they passed through, and what seemed still more incomprehensible was that the action of the magnet depended upon the way in which the cathode rays were generated; the more the air was rarefied in the vacuum tube where they took origin, the greater was the magnetic deflection. At every step the physicist thus met with some new problem, which he could by no means explain under the new current theory of luminous radiations. And, finally, as if it were to establish one more affinity between these extraordinary rays and common light, Lenard discovered that when a photographic plate was brought near to the aluminium "window," the silver salts of the plate were decomposed by the invisible rays. One step more—a simple piece of wire placed

between the "window" and the plate—and Lenard would have obtained a shadow photograph similar to those obtained a few weeks later by Röntgen.

This step was made by Röntgen. His researches, however, were carried on on a somewhat different plan. He also took a vacuum tube, and made it glow in the usual way, but he entirely wrapped it up in black paper, and when its light was thus intercepted, and the room was quite darkened, he saw that a piece of paper striped with fluorescent matter began to shine when it was approached to the tube, exactly as if it were struck with rays of sunlight or arc-light. The effects were thus similar to those which Lenard obtained with his cathode rays, but there was a great difference in intensity. The invisible radiations which emanated from the vacuum tube wrapped in black paper made the fluorescent screen shine even at a distance of six feet. Their force of penetration through solids was also much greater. Pine boards one inch thick, a book of a thousand pages, two packs of cards, and a block of ebonite over one inch thick, proved to be as transparent to the new rays as glass is to ordinary light; they passed through these bodies and made the fluorescent screen shine. Even metals, especially the lighter ones, were to some extent transparent to the new radiations; a sheet of aluminium over half an inch thick still allowed them to pass, and only the heavier metals easily intercepted them; still, a thickness of 8-1,000 of an inch of platinum and of 6-100 of an inch of lead was required to secure practical opacity to these rays. And, finally, when the hand was placed between the tube and the fluorescent screen, the result was especially striking; the flesh was pierced by the rays without any trace of absorption while the bones totally intercepted the rays, and threw black shadows. A shadow of the skeleton of the hand, devoid of the flesh, thus appeared in black on the fluorescing screen. . . .

As soon as Röntgen's discovery became known through a preliminary communication which he made in December last at the fiftieth anniversary of the Würzburg Society of Physics and Medicine, his experiments were repeated all over Europe, with full success.—From *Recent Science*, by Prince Kropotkin: *Nineteenth Century for March.*

April *Monist* also contains two articles on Röntgen's rays by leading European scientists. Professor Ernst Mach, of Vienna,

describes a method of applying the new rays to an old device, invented by him for taking stereoscopic or solid pictures of objects. The usual Röntgen pictures appear flat. By the suggested modification of this process they are made to appear in solid relief like real objects. Professor Schubert, of Hamburg, writes at length on the *x*-rays, reviews in simple language their history, embracing the researches of Faraday, Geissler, Hittorf, Pluecker, Crookes, Lenard, and Röntgen, discusses the physical character of the rays, and lastly expounds the methods of work so successfully employed in the Hamburg State Laboratory. Two beautiful actinograms accompany this article—one of a fish with shells in its intestines, and one of a lady's hand, into which a needle had been run. No article has appeared on this subject more adapted to the popular comprehension.

LIFE.—"What is life but what a man is thinking of all day?"—Emerson.

If life were only what a man
  Thinks daily of—his little care;
His petty ill; his trivial plan;
  His sordid scheme to horde and spare;
His meagre ministry; his small
  Unequal strength to breast the stream;
His large regret—repentance small;
  His poor, unrealized dream—
'Twere scarcely worth a passing nod;
  Meet it should end where it began.
But 'tis not so. Life is what God
  Is daily thinking of for man.

—Julie M. Lippmann, in *Harper's Magazine* for April.

STRONG MEN OF ANCIENT GREECE. — The mythopoetic fancy of the Greeks attributed many feats of strength to these heavy athletes. Milo of Croton had such strength in his hands and wrists that no one could move his little finger. He could hold a pomegranate uninjured in his hand while his antagonist endeavored to wrest it from his grasp. Theagenes of Thasos, the winner of fourteen hundred crowns for boxing and the pancratium, when only nine years of age carried on his shoulders from the market-place to his home the bronze statue of a god. Melancomas stood two days with outstretched limbs, and Polydamas with one hand stopped a chariot at full

speed, held up the wildest steer by his hind leg, and overcame a lion. Polydamas is said to have sustained for some time a falling grotto, but finally succumbed, and was crushed to death.—"The Old Olympic Games," by Professor Allan Marquand, in the April *Century.*

Greek boys began to be trained in bodily exercises at a very early age—often at ten years. The problem was not merely to develop strength and health, but to secure grace and beauty, perfect beauty being thought the outer expression of perfect strength. It was this passion for the beautiful in every phase of Greek life which made its sculpture and architecture the noblest the world has seen. But the thought had a still deeper root. The Greek assumed that it was only in the perfect and symmetrical body that the well-balanced mind could dwell; so physical culture held a foremost place in his plan of education, and the daily toils of the palestra (or wrestling-field) and the gymnasium were a part of the life of the growing lad, and a part not to be shirked. The part taken by boys in the Olympic games shows how deeply this festival had taken root in Greek thought and life.—"The Olympian Games," by G. T. Ferris, in April *St. Nicholas.*

The revival of the Olympic games at Athens in April is already attracting great attention. *Scribner's* for April contains an account by Professor Richardson, of the American School at Athens, of the restoration of the great Stadion, or amphitheatre, at Athens, where the games are to be held. This is illustrated with photographs of the work in progress. The same number will also contain a bit of historical fiction by Duffield Osborne, which is called "A Day at Olympia," and restores the atmosphere and action of the old games, with a striking series of illustrations full of the old classical spirit, by a young artist, C. K. Linson.

THE BICYCLE IN RELATION TO HEALTH. -- The greatest danger of bicycling, in common with other sports, results from the strain which active exertion necessarily brings upon the heart. That all-important organ tends, like other muscles, to lose tonicity under the sedentary conditions of the average life, and readily becomes embarrassed if asked to perform an unusual work, as any one who is not in training can assure himself by climbing a flight of stairs rapidly, or attempting to run a few hundred yards. Under such conditions the heart often doubles the frequency of its beat in attempting to dispose of the

increased flood of blood that is driven into it by muscular contraction. With a diseased heart the strain thus imposed may be hazardous. Several cases are recorded where a person with such a heart has fallen dead while riding a bicycle. But then thousands of other cases are recorded where persons have similarly fallen dead while riding in carriages, or while sitting in easy-chairs at home. It does not follow, I presume, that we must all eschew easy-chairs, carriages, and bicycles, but it does follow that any one who has reason to doubt the normality of his heart may wisely consult a physician before deciding to undertake any active exertion, bicycling included.

Even the perfectly normal heart may suffer permanent injury if subjected to prolonged and excessive strain. This fact should be borne in mind by every novice in bicycling, for it is peculiarly easy to overdo under the exhilarating influence of this pastime. Presently the heart gains tone and strength, and is able to adapt itself to the new conditions; but until time has been given for this it is the part of wisdom to proceed carefully, "training on" gradually. Furthermore, the person who is wise will use reasonable discretion as to the amount of exertion he will undertake even when thoroughly trained. As we have inherent differences of strength, each one of us should be in some measure a law unto himself as to how fast and how far he shall ride, keeping well within the limits of his own strength and endurance, and remembering that healthful fatigue is one thing, complete exhaustion quite another. The person who rides for pleasure and health and uses reasonable judgment will not feel obliged to cover ten miles in a half-hour, or to pedal up every hill that some one else has managed to climb. Above all, he will eschew such inane and harmful performances as "century runs" and similar attempts to cover distance for the mere sake of covering it, regardless of consequences.—*Harper's Weekly.*

"Pygmy Races of Men" forms the subject of an interesting essay by Professor Frederick Starr, of the University of Chicago, in the April *North American Review*, Prof. Starr confidently asserting that hints of the past existence of such peoples in America are not wanting.

PHOTOGRAPHS TAKEN BY THE INVISIBLE RAYS are shadow pictures, and one can form but little idea of the exact position, for instance, of a shot in the thicker portion of the hu-

man hand. One would know, to be sure, the line along which the incision for the extraction of the shot should be made, but one would be doubtful whether to cut from the palm inward or from the back of the hand inward; and in certain positions, on account of arteries, it would be important to decide which method to take. I have discovered that the process called triangulation can be applied. Suppose that two candles are placed in a dark room at the same distance from a sheet of white paper. Hold a pencil near the paper between the paper and the candles. We shall obtain two shadows. If we measure the distance between the shadows, and if we know the position of the candles, we can find the position of the pencil by drawing lines from the shadows to the candles. Where these lines intersect is the position of the pencil.—From "The New Photography by Cathode Rays," by Professor John Trowbridge, in the April *Scribner's*.

AGRICULTURAL USES OF BACTERIA.—It is known that the flavor of butter and of different kinds of cheese is due to various bacterial ferments, and there is good reason to suppose that a better product and greater uniformity would be attained by the use of pure cultures of the species upon which special flavors depend. I understand that in this country quite a number of dairies are now using pure cultures of a certain bacillus (Bacillus 41 of Conn) for giving flavor to their product. It is probable that similar methods will soon be introduced in the cheese-making industry. A recent English publication, which I have not yet seen, is entitled Bread, Bakehouses, and Bacteria. It will, no doubt, be found to contain information of practical value to those engaged in bread-making.

Agricultural chemists predict that in the near future cultures of the nitrifying bacteria of the soil will be made on a large scale for the use of farmers, who will add them to manures for the purpose of fixing the ammonia, or perhaps will distribute them directly upon the soil. Should this prove to be a successful and economic procedure, the extent of the interests involved will make it a "practical result" of the first importance. Another application of our recently acquired knowledge which has already proved useful to farmers in certain parts of Europe relates to the destruction of field mice by distributing in the grain fields bread moistened with a culture of bacillus which causes a fatal infec-

tious disease among these little animals.—Dr. G. M. Sternberg, in *Appletons' Popular Science Monthly for April.*

The *Review of Reviews* is almost indispensable to the general reader who wishes to keep abreast of the rapidly developing international questions of the day. In the April number there is a full and able editorial discussion of the complicated African situation, which is described as "the drama of 'Europe in Africa.'" The mixed interests and motives of England, Russia, Italy and France in the Dark Continent are clearly set forth. Russia's general attitude toward the European powers is also discussed, and the editor comments briefly on America's relations with Spain, our interest in the Cuban revolution, and the present status of the Venezuelan boundary dispute. In addition to this editorial treatment (in the department entitled "The Progress of the World") the *Review* presents a remarkably complete survey of the Cuban situation by Murat Halstead, a summary of the best current thought in England on the subject of international arbitration, and a vivid account of the relief work now going on in Armenia. In short, the *Review of Reviews* records a month's activities in both hemispheres.

There is always an endless surprise of good things to be found in *Littell's Living Age*, and recent numbers have been no exception to the rule. We note in particular "Recent Science," by Prince Kropotkin, the eminent Russian scientist and revolutionist, which consists of two papers, "Röntgen's Rays" and "The Erect Ape-man." Notable papers in other late issues are "South Africa and the Chartered Company," by Charles Harrison; "In Praise of the Boers," by H. A. Bryden; "National Biography," by Leslie Stephen; "The Baltic Canal and How it Came to be Made," by W. H. Wheeler; "Spenser, and England as he viewed it," by Geo. Serrell; "Cardinal Manning and the Catholic Revival," by A. M. Fairbairn; "Personal Reminiscences of Cardinal Manning," by Aubrey de Vere; "The Rival Leaders of the Czechs," by Edith Sellers, etc., etc.

The above partial list gives but a trifling idea of the great field covered by *The Living Age.* Published weekly, $6.00 a year. Littell & Co., Boston.

PAMPHLETS, REPORTS, ETC., RECEIVED.

Various Fractures, Simple and Compound, Clinical Report of Fifteen Cases.

Granular Lids, with Cases in Practice, by A. Britton Deynard, New York.

Relative Value of Operative and Hygienic Measures in the Treatment of Tuberculosis and Neoplasms of the Bladder, by L. Bolton Bangs, M. D., New York.

Static Electricity in Cutaneous Affections, by S. H. Monell, M. D., New York.

Surgical Treatment of Laryngeal Tuberculosis, by J. W. Gleitsmann, M. D., New York.

Zoster, by William S. Gottheil, M. D., New York.

Carcinoma of the Cervix, by Hunter Robb, M. D., Cleveland, Ohio.

Regulations Concerning Cattle Transportation, United States Department of Agriculture, Washington, D. C.

Cornstalk Disease and Rabies in Cattle, Ibid.

Statistics of the Dairy, Ibid.

Climbing Cutworms in Western New York, Cornell University Agricultural Station, Ithaca, N. Y.

Tests of Cream Separation, Ibid.

Japanese Plums, Ibid.

Climatic Causation of Disease, I. M. Cline, M. D., Galveston, Texas.

Degenerative Heredity, Charles Denison, M. D., Denver, Colo.

Bacteriology of Dengue, J. W. McLaughlin, M. D., Austin, Texas.

Proceedings of Engineering Society of Western Pennsylvania, Daniel Carhart, Secretary, Allegheny, Pa.

Educational Value of Engineering Studies, Lehigh University, South Bethlehem, Pa.

Course in Civil Engineering, Ibid.

School of Mechanical Engineering, Ibid.

Outline of the Physical Theory of Fermentation, G. J. W. McLauchlin, M. D., Austin, Texas.

Congenital Double Fistula of the Lower Lip, Simulating a Supernumerary Nose, by Lewis H. Miller, M. D., Brooklyn, N. Y.

Hernia in Infancy, G. W. B. de Garmo, M. D., New York.

Household Garbage Carbonizer, Sanitary Construction Company, 58 Pine street, New York.

Treatment of Hyper-pyrexia in Children, by Louis Fisher, M. D., New York.

Kinetic and Therapeutic Energy of Drugs, by J. W. McLaughlin, M. D., Austin Texas.

Laryngeal Neoplasms, by Walter F. Campbell, M. D., New York.

Thoroughness in Medical Education, by Hunter Robb, M. D., Cleveland, Ohio.

State Board of Medical Examiners of New Jersey, Annual Report, William Perry Watson, M. D., Secretary, Jersey City, N. J.

Aseptic and Antiseptic Midwifery in Private Practice, by Francis H. Stuart, M. D., Brooklyn, N. Y.

Movable Kidney, by Charles P. Noble, M. D., Philadelphia, Pa.

Nephritis of the Newly Born, by A. Jacobi, M. D., New York.

Hypertrophic Rhinitis, by E. J. Bermingham, M. D., New York.

Sleep in Its Relation to Diseases of the Skin, by L. Duncan Bulkley, M. D., New York.

Certain Doubtful Points in the Management of Abortion, by C. P. Noble, M. D., Philadelphia, Pa.

Dermoid Tumor of Both Ovaries Complicated by a Deposit of Bone upon Each Side of the True Pelvis, Having no Connection with the Tumors, Ibid.

Some of the Newer Problems in Abdominal and Pelvic Surgery, Ibid.

Technique of Emptying the Uterus in Inevitable Abortion, Ibid.

Necessity of Complete Extirpation of Tumors and the Importance of Rapid Cicatrization of the Wound, Frederick Home Wiggin, M. D., New York.

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The DELAY OF THIS NUMBER is due to REMOVAL and change of printer.

☞All correspondence and exchanges with the SANITARIAN, and all publications for review, should be addressed to the Editor: DR. A. N. BELL,

337 Clinton Street, Brooklyn, N. Y

# THE SANITARIAN.

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## THE INTRODUCTION OF PUBLIC RAIN BATHS IN AMERICA.

### A HISTORICAL SKETCH.

By HARVEY E. FISK, NEW YORK.

The path of the sanitary reformer is so frequently "strewn with thorns rather than roses," that, in order to encourage those who strive in it, the following sketch is given of the difficulties with which the projector of a great improvement in public baths had to contend and overcome, as an animating example.

It had for its object the bathing of the masses—not the luxurious bathing of the elite, as in ancient Rome—upon such a scale as had never hitherto been attempted.

The first plea for the rain baths in this country was made by Dr. Simon Baruch of New York, and appeared as an editorial in the Medical Times and Register of Philadelphia, August 24, 1889.

The article was favorably commented upon by the New York World of Aug. 30, following.

In an essay on "The Status of Water in Modern Medicine," read before the Social Science Convention at Saratoga in September, 1890, plans for the Rain Bath and arguments for their adoption at Public Baths were presented by Dr. Baruch.

Upon his return from Germany, where he had investigated the working of the Public Rain Bath, he presented, as Chairman of the Committee on Hygiene of the N. Y. County Medical Society, the following report:

#### REPORT ON PUBLIC BATHS.

Modern hygiene has, by simplifying the methods of applying its principles, attained remarkable achievements. Its chief advances have been made by the recognition of cleanliness as the

essence of true sanitation. Just as the modern surgeon has, by gradual step and deductive reasoning, reached the conclusion that in strict cleanliness of his person, of his instruments, and of the surface to be treated is to be found a true asepsis, so has the modern sanitarian come to realize that strict cleanliness applied to the air, to food, to clothing, and to the person fulfills the chief indications of true hygiene.

The sterilization of milk, which has been so great a boon to infants, is the most recent illustration of this principle, inasmuch as it is simply a process of purification which keeps the milk sweet until used.

This learned body does not need to have the importance of personal cleanliness impressed upon it by stilted phrases, nor need your Committee dwell upon the immense sanitary advantages accruing from the maintenance of the functions of the skin by the disciplinary and depurative action of the bath. These are truisms with which even the lay public are sufficiently familiar.

How to secure to the needy classes—among whom diseases arising from, and encouraged by, lack of cleanliness are most rife—access to baths which will not repel them by expensiveness, loss of time, and lack of convenience, is a subject that your Committee has carefully considered and practically investigated.

The baths which our city authorities have wisely and efficiently provided during the Summer months have proved successful in the encouragement they have given to that portion of the community whose only means of obtaining a bath is in our open waters. Cleanliness and refreshment are thus secured to a small but needy portion of the community. But these are chiefly utilized by the younger and more vigorous portion of it, because they involve a certain expenditure of energy and resolution. In Winter, when thick clothing and unventilated dwelling rooms most encourage the accumulation of excreta and filth upon the skin, these open baths are entirely unavailable.

Your Committee would recommend the erection, in the midst of our populous tenement districts, of public baths which, by their accessibility and freedom from expense, would tempt the populace into the practice of bathing as a habit. This would be bathing for cleanliness, a true sanitary measure whose power for preventing the origin and spread of disease need not be insisted upon in this society. The problem has already been practically solved in Germany, where, under the stimulus of Lassar's labors, public baths

have been erected in several large cities, which fulfill their objects most admirably and which may serve as examples worty of imitation. In this city also a number of benevolent gentlemen have formed a society for the promotion of public baths. Prizes have been offered for the best plans of such buildings, and, judging from the character of the gentlemen engaged in the work, it will doubtless be carried to a successful issue.

Several points should be constantly held in view in the construction of public baths:

1st. They must be located in the very centre of the overcrowded districts.

2d. Their exterior must be modest, so as not to repel the poor and lowly by their architectural pretensions.

3d. They should be so constructed that a cleansing bath may be obtained without trouble or expense, or at a very trifling expense, and without sacrifice of much time.

The distinguishing characteristic of the public baths which may now be found in many German cities and in some large factories is the abolition of the bath tub and the substitution of a warm rain or shower bath for the old-fashioned tub bath.

The advantages of such warm shower baths, falling with considerable force, from a reservoir of some height, upon the body, are self-evident:

1st. The outlay for tubs is avoided, as well as the cost of their wear and tear.

2d. The avoidance of filling, emptying, and necessary scrubbing of the tub for each bath economizes labor and expense.

3d. The time necessary for a cleansing shower bath is far less.

4th. The cleansing is much more thorough.

5th. The space needed for the shower or rain bath is one-half of that required for the tub bath.

6th. The economy of water is enormous. The tub bath requires, according to Lassar's calculation, 200 litres of water, while for the rain bath 10 litres are ample.

7th. The danger of communicating disease is placed beyond the possibility of careless attendants even.

8th. The refreshing effect of the shower, whose temperature may be gradually reduced after the cleansing, is valuable and prevents danger from the relaxing effects of a warm tub bath.

The accompanying sketch, made by Messrs. Brunner & Tryon, architects of this city, presents a neat and inexpensive public

bath with 90 cells, offering bathing facilities for 270 hourly. Space and labor are economized to the utmost without sacrifice of efficiency and neatness. The Volksbad in Vienna, which your chairman has personally visited, is situated in the centre of the laboring population, in the rear of a building. It has separate entrances for the sexes, and is divided into cells 80 cm. deep and 1 metre wide, with passageways of 1 metre. There are 42 cells for males and 28 for females. In the ceiling of each cell a large shower nozzle is constructed, which is supplied with water at 95° F. Upon payment of five kreuzer (about two cents) the applicant receives a towel, an apron or mantle, a piece of soap, and the key of a closet in which he places his clothes. He turns the water on, soaps himself thoroughly, and again opens the valve of the shower, which descends with so much force that it aids the bather in the cleansing process. In five minutes he finds himself more clean than he would become in a much longer period in a tub bath, the water of which must become soiled before its termination.

In addition to these advantages, the soiled water at once flows from the body upon an inclined asphalt floor into a gutter, and thence into the sewer.

The next bather may now enter without previous preparation of the cell, or at least after a rapid flushing of it, because not a particle of detritus is left behind by the preceding bather.

The economy of space arising from the possibility of erecting the bath on the first or second floor of any tenement house in an inexpensive locality—in the neighborhood of some factory using steam—the economy in executive and manual labor, the extreme facility of utilization, are factors that must commend the warm shower or rain baths to health authorities and philanthropists.

The attachment of these simple baths to the public schools would be a great boon to the poor, relieve the tenement districts greatly, furnish a potent preventive of disease, and cultivate the inestimable habit of cleanliness among the young. As the school buildings are usually heated by steam, the heating of water for bathing purposes would be comparatively inexpensive.

The room required is small, any well-ventilated and heated basement room being sufficient. The children might be required to bring their own towels. Two or three hours every afternoon, the entire day on Saturday, and, " since cleanliness is next to godliness," a portion of Sunday might be devoted to this healthful practice. The outlay would be small, but the benefit very great, in this as in other public baths.

That expenditure of money for the prevention of disease is the most profitable application of public funds has become an accepted fact in modern government. In no direction would money be more beneficently and profitably expended than in the construction of these public baths, into which the passer-by may be tempted by ease of access, promise of comfort, and freedom from expense. A river bath in summer requires some resolution, some energy, but a warm shower bath in a well-lighted, well-ventilated, and pleasantly warm room, with facilities for drying and dressing, is a luxury that may tempt the laziest and dirtiest tramp.

The people especially, who have literally "earned their bread by the sweat of their brow," should find, without outlay or trouble, in their own vicinity a comfortable place where they may rid themselves of the filth accumulated upon their persons by their daily labor.

That the life, liberty, and property of every citizen, rich or poor, shall be protected, is the chief axiom of our government; that their health, more precious than all these, be protected, is an idea whose dawn gives promise of better and brighter days for the poor and lowly, who, owing to their helplessness, should be our special care. A tithe of the amount spent in the execution of quarantine to bar out disease, the erection of conduits to furnish pure and abundant water, the inspection of food, etc., would, if applied to the construction of public baths, enormously aid our health authorities in their important mission.

### THE CENTRE MARKET BATH.

A few days after the foregoing report was read, the first step was taken in New York in the practical development of the Rain Bath.

By invitation at the hands of Dr. Crampton, from the New York Association for Improving the Condition of the Poor, Dr. Baruch appeared before the Association on the 25th of November and on Dec. 2, 1890, Mr. John Paton presiding, and convinced them that the impracticability of constructing a Public Plunge Bath on account of the insufficiency of the water supply and other obstacles could be overcome by the adoption of the Rain Bath.

A few days thereafter, Dr. Baruch received a letter from Mr. Longworthy, Secretary of the Association, as follows:

"Our President desires me to return you our sincere thanks for your valuable information concerning the project of Public

Baths given to the Executive Committee last Tuesday evening. He also desires me to ask if you can make it convenient to attend the special board meeting on Tuesday in order to explain to them your views and exhibit your plan. Our ideas are taking shape, and I expect a favorable report from the committee appointed in this matter."

With remarkable energy a Building Committee, of which Mr. W. Gaston Hamilton was Chairman, was appointed, and the building at Centre Market Place was constructed, which is a monument to the enterprise and practical philanthrophy of this Association. The following letter from the President, dated Aug. 26, 1891, explains Dr. Baruch's connection with this first example of the Public Rain Bath:

My Dear Sir: I hasten to acknowledge with thanks your very kind letter of the 21st inst., together with all your good wishes, for the success of the People's Baths.

I am glad to be able to say that the experiment has proved a great success, and we shall never forget the very great obligations we are under to you in this matter.

I inclose newspaper cutting, with particulars of the opening, and remain, yours very truly, J. PATON.

The public press of the day contained full accounts of the inauguration of "this novel bathing establishment, in which the poor could obtain a warm, cleansing bath with towels and soap for a nickel."

The success of this experimental enterprise is attested by the fact that from 70,000 to 80,000 people have obtained cleansing baths here every year since its opening and that it was utilized as a model for the

BARON DE HIRSCH BATHS.

The New York Herald of Oct. 25, 1891, chronicles the inauguration of the Baths constructed by the Baron De Hirsch Fund, as follows:

"These Rain Baths are something entirely new for this country. Attention was first called to this system of Baths in this country by Dr. Simon Baruch, consulting physician of the Montefiore Home for Chronic Invalids, and other institutions, and editor of the Dietetic Gazette. Dr. Baruch spent six months in Europe studying the baths of all the foreign nations. On his return to this country he brought the subject before the Academy of Medicine, and headed the rapidly growing movement for Pub-

lic Baths. His idea is that in order to popularize bathing among the poor of great cities, public baths should be established in the immediate vicinity of the populous tenement districts, where their presence offers a constant allurement, and where the people may obtain pure water, soap, and towels, as well as comfortable accommodations. The Hirsch Fund trustees, after a conference with Dr. Baruch, decided to adopt the German Rain Bath system."

This Bath, being located at the corner of Henry and Market Streets, is frequented mostly by German, Polish and Russian Jews, although it is open for the poor of all nations and creeds. Its beneficent work among these people, who have no conveniences for bathing, is evidenced by the large number who resort to it. The records show that 70,000 baths are given here annually.

DEMILT DISPENSARY BATHS.

These were built shortly after the Centre Market Baths, and upon the same plan. The number of bathers is about 15,000 annually. There are six Rain Baths and one tub bath. Chicago has built a public bath under the energetic initiative of Dr. Gertrude Wellington.—Philadelphia, Buafflo and other cities are following.

CHICAGO PUBLIC BATHS.

The first successful movement for Free Public Baths in the City of Chicago was undertaken by a committee under the control of the then existing " Municipal Order League," about February, 1893. The committee consisted of Dr. Gertrude Gail Wellington, Dr. Julia Lowe, Dr. Sarah Hackett Stevenson.

The city being divided into West, North and South Side, each of the ladies took their respective resident quarters for their work; that is to say, Dr. Wellington for the West Side, Dr. Lowe for the South Side, Dr. Stevenson for the North Side. Dr. Wellington was successful in securing an appropriation of $12,000 from the finance committee of the City Council for a West Side Bath, in March, 1893.

Being appointed by Carter H. Harrison, then Mayor of Chicago, Dr. Wellington proceeded at once to formulate the plans for this bath, which was in due time named, at her suggestion to the Municipal Order League, The Carter H. Harrison Bath. In the following January the Bath was completed and ready for

public use. It is situated at No. 192 Mather street, surrounded by a dense population of working people. It is a handsome structure of pressed brick and brown stone, twenty-five feet wide by one hundred and ten feet deep. In the basement is the laundry and two furnaces, one for heating the building, the other for heating water for the baths. In the front of the main floor is a room sixteen feet square, with seating capacity for forty people; beyond this are the bathrooms, with necessary toilet accommodations, occupying fifteen hundred and fifty feet square. The baths consist of eighteen shower and tub baths, supplied with hot and cold water, soap and towels. By allowing twenty-five minutes for a bath, the capacity is two thousand six hundred persons a week.

On entering the waiting room, each person is given a check, which checks are called in consecutive order, as the bathrooms are vacated. Two minutes are allowed for undressing after entering the bathroom, when the water is turned on for eight minutes. About one minute before the water is turned off notice is given, to allow time for the final rinse-off. At the same time notice is given and placards also advise that fifteen minutes' time is allowed for dressing. About four hundred towels are used daily. During the year about six thousand cakes of soap and about one hundred tons of coal have been used.

Total attendance for 1894 was 91,379, of whom 20,334 were females. The total expenditures on all accounts were $3,469.65, and the average expense of each bath given was therefore three and four-fifths cents. Mondays and Thursdays are reserved for women, girls and small children with their mothers, and the temperature then is 105 degrees. On other days the temperature is kept at 100 degrees. Mondays and Thursdays are very largely attended by shop-girls. Many people resort to this bath, not only for the purpose of cleanliness, but for relief from rheumatism and other diseases, with, as they claim, good results.

It is only a question of time when the present capacity will have to be doubled or even trebled, and as soon as practicable one division will be given over to women and children exclusively; so that these free baths may be available to them every day instead of only twice a week.

Under Dr. Wellington's advice the plans called for thirty-six showers. However, the League insisted, under the advice of Jane Adams, of the Hull House, and Dr. Stevenson, of

the State Board of Health, that a plunge twenty by thirty feet be constructed in place of the sixteen showers, which has proven an entire failure, both from its size and the aversion of even the working people sharing so small a body of water with each other. This bath was erected at a cost of $10,856, leaving the rest of the $12,000 for running expenses.

Since 1895 135,159 persons have bathed, of whom 28,855 were females, making a total in the entire time the bath has been opened—two years and nearly six months—of 226,538, of whom 49,189 were females.

In January, 1894, in the event of the resignation of Dr. Lowe from the work of the South Side Bath, Dr. Wellington was requested by the Chairman of the Finance Committee of the City Council to proceed with the work for that portion of the city whereupon John P. Hopkins, elected to the Mayoralty after the sudden demise of Carter H. Harrison, joined her in an appeal for an appropriation of $20,000. In the following March an appropriation of $12,000 was made for a South Side Public Bath. Dr. Wellington set about securing a location for this bath. A desirable piece of ground, fifty by one hundred and twenty feet, was obtained at Thirty-ninth street and Wentworth avenue, in the vicinity of the Stock Yards and contiguous to a large class of unwashed, living in tenements, with no greater facilities for bathing than a kitchen sink. This lot was rented for $300 yearly, with an option of purchase by the city at any time for $5,000. Work was begun upon the plans for this bath by the City Architect, Bruce Watson, in May, 1895. The plan calls for two wings, respectively for men and women, each twenty-five by one hundred feet long, consisting of sixty-eight showers on the main floor. In the basement or first floor we have a barber shop, soup kitchen, public laundry, dry room and boiler room. The outside is neatly constructed of pressed terra cotta brick and stone facings, and is to be artistic in design, with the inscription, "The M. B. Madden Public Bath," the name of which was given by the Free Bath and Sanitary League, the outgrowth of the old Municipal Order League, who surrendered their charter in May of last year. The bids for this bath will be let in a few days by our Commissioner of Public Works, William Kent.

The ladies of the League have been petitioned by the Chicago Commons, at 140 North Union street, to place the Geo. B. Swift Bath (for which appropriation has not yet been made) in their

vicinity, and to this end interested persons in and out of the League are working to secure an appropriation.

A strong and successful effort of the League was made in June of last year in securing surf bathing in Lake Michigan at Lincoln Park. Thousands of children, young boys from factories, tired men from the workshops, women clerks, who sweltered in hot basements, enjoyed the refreshment of summer bathing in Lake Michigan.

The Free Bath and Sanitary League, of which Dr. Gertrude Gail Wellington is president, consists of a small working body of women, supplemented by (when complete) an honorary membership of about three hundred of the most prominent residents of the city, and who are appointed to membership for a period of fifty years, in order that the members may feel a continued interest in the devevlopment of a perfect system of public baths for the City of Chicago.

The present Mayor, Geo. B. Swift, is not only an honorary member, but is a stout advocate of the cause and much interested in securing for the people this comfort which they most justly deserve. The League, composed so largely of City Aldermen and other officials, will continue its work supplementary to the City Health Department throughout the years to come. The Mayors who have most courteously championed this Free Bath movement are the following: Hempstead Washburne, Carter H. Harrison, John P. Hopkins, Geo. B. Swift.

It is the earnest wish of the League to secure public bathing in all the Parks of the City, at least during the Summer, and it notes, with just pride and commendation, the effort that has secured for Douglass Park, on the West Side, a building three hundred feet long by one hundred and eight feet wide, constructed of brick and stone, containing a tank for men one hundred and twenty feet by fifty-five feet, and for women sixty feet by sixty feet, in connection with which they have provided a large and well equipped gymnasium. A large veranda surrounds the building, from which can be seen field sports, and which will be completed by July 4th of this year. The League has also petitioned the City Council for a large Bath in the Lake Front Park.

In the early work for the Public Baths here in Chicago, communication was opened with Dr. Simon Baruch, of New York City, prime mover in Public Baths for that City. Many valuable suggestions from him were deemed worthy of adoption, and the

Free Bath and Sanitary League are truly grateful for aid so timely given.

On October 23d, 1891, Dr. A. N. Bell, in a paper on "The Bath: Its Necessity and Adaptations," read at the meeting of the American Public Health Association, Kansas City, Mo., said:

"These baths are simply arranged, built in the most economical, yet substantial manner, and divided into spaces just large enough for an adult to stand and move comfortably in. The bather soaps himself and turns on the cold or warm water, which falls upon him as a spray-douche; the mechanical action of which spray-douche, aided by his own efforts, rapidly cleanses the body, and the water flows away over the latticed floor into a receptacle which conveys it to the drain pipes. The time, consumption of water and attendance are thus reduced to a minimum; cleanliness of the bathing room is rapidly obtained and the danger of contagion, which would deter many from resorting to the tub baths, is entirely obviated.

"Simple rain baths of warm water with soap should be attached to our public schools, and the afternoon hours should include the task of cleansing the bodies of the little ones."

Dr. Baruch, however, was not content with this mere introduction of the system to the public, followed though it quickly was by its introduction into several public institutions in this country and Canada. He urged legislation for the expansion of the system.

Recognizing the value of the support of the medical profession in his work, he seized every reasonable opportunity to enlist their attention. Besides the papers already referred to, he made it the subject of "A Plea for Public Baths, Together with an Inexpensive Method for Their Hygienic Utilization," at a meeting of the Northwestern Medical Society; also in the Section on Hygiene, New York Academy of Medicine, Dec. 5, 1890, and at a meeting of the general session, April 2, 1891, urging the co-operation of the Academy, which was secured by the adoption of a resolution to that effect. That the medical press has given generous and continuous assistance in the furtherance of this movement is evident by the following excerpta:

The Medical Record of May 30, 1891, makes editorially a Plea for Public Baths, concluding: "There should be a number of baths distributed throughout the city and convenient to the tenement population. We see no reason why the city should not

undertake this work, since it would redound so much to the health of the people. The American people in the past have acquired a rather unenviable reputation for their niggardliness in supplying themselves with bathing facilities. It is a reproach which ought to be removed, and the establishment of Public Baths in our great city would do much to promote this end."

This editorial was commented upon by the New York Herald of June 1st, with the suggestion that "there should undoubtedly be as the Record urges, a number of Baths distributed throughout the city for the convenience of the tenement house population. This should have been attended to long ago."

The Medical News of Sept. 9, 1891, says editorially of the "People's Bath": "Dr. Baruch would be a little more than human if he were not elated at this practical demonstration that all 'hobbies' are not 'mere theories,' and the 'cold water hobby' is one that well ridden will do great good to a whole community. He has made it possible for a working man or boy to have the best kind of a bath with a new cake of soap and clean towels all for five cents, and if the five cents is hard to find, the bath may be had scot free. Such things are bright compensations for many of the evils of civilization. Every city awaits a duplication of this noble charity, and each of us should try to bring it about."

One of the most surprising incidents in the history of this enterprise was the apparent obtuseness of members of the Legislature and some others in authority to comprehend its advantages, sometimes so discouraging as to threaten an utter rebuff.

The first advantage gained with the public authorities was through the assistance of the City Board of Health, before whom Dr. Baruch first appeared in its advocacy, in December, 1890. Dr. J. D. Bryant, Health Commissioner; Dr. Cyrus Edson, and Mr. Wilson, President of the Board, all cordially approved of the idea, but they were without authority to put it into execution. Dr. Baruch next directed his efforts to obtain the approval of the Mayor and Board of Aldermen of the city. He appeared before Mayor Grant on Tuesday, April 20, 1891, and endeavored to convince him of the importance of lending his assistance to the furtherance of this sanitary measure. This appeal proved to be futile. He also placed himself in communication with Alderman Flegenheimer, whose sympathy with the cause of Public Baths had been shown by his offer in the New York

Sun to open a subscription for this purpose by donating $250. To his efforts was due the passage by the Board of Aldermen, on May 11, 1891, of a resolution "appropriating $25,000 for an experimental Rain Bath, and asking the Mayor to appoint a committee of three to supervise its construction."

Regarding this a triumphant concession from the authorities, the doctor at once obtained the consent of three influential citizens to act as such committee, as suggested by Alderman Flegenheimer, who volunteered to influence the Mayor in furtherance of the resolution.

After several interviews with the Mayor, the Alderman wrote, May 20, 1891: "In view of the statements made to me by the Mayor, I am not inclined to suggest any names to him at present. I believe that he will not act in the matter, unless pushed to it by an overwhelming public sentiment."

Letters of a similar tenor convinced the doctor that it would be wise to suspend all efforts until a new administration came into authority.

In the mean time an ardent advocate of Public Baths arose in the person of the Hon. Goodwin Brown of Albany, a member of the present Lunacy Commission, and at that time in the Legislature.

This gentleman prepared a bill called Chapter 473 of the Laws of 1892, which was approved by the Governor in May, 1892, as follows: "It shall be lawful for any city, village, or town to establish free Public Baths. Any city, village, or town may loan its credit or make appropriations of its funds for the purpose of establishing free Public Baths."

We are informed that Mr. Brown endeavored to make this bill mandatory, but apprehending Governor Flower's veto he presented it in this permissive form.

This is the first statute on Public Baths for all cities enacted in the State of New York. Although it remained a dead letter, it was the nucleus of the more recent excellent statute, which is also the work of Mr. Goodwin Brown.

When Mr. Gilroy was elected Mayor of New York, the fact that he, while Commissioner of Public Works, had identified himself with the Summer Swimming Baths, gave Dr. Baruch hope that a renewed effort might enlist his sympathies in behalf of Public Baths in the city.

Mr. Otto Kempner, a staunch advocate of these Baths, had

been elected to the Assembly, and had written Dr. Baruch, on Dec. 8, 1892, as follows. " I am preparing a bill which I propose to introduce into the Legislature, providing for the establishment of thirty Public Baths, one in each district, based on your principles, which shall also create the office of Bath Superintendent. I would be pleased to get your opinion about it and any suggestions you may desire to offer."

On Feb. 16, 1893, Mr. Kempner introduced " An act to establish a bureau of Public Baths in the City of New York, and to provide for the construction and maintenance of six permanent Public Baths in said city." Dr. Baruch consulted Dr. J. D. Bryant, who had taken a deep interest in this movement from its inception, and who has had large experience in sanitary legislation. The latter wrote him under date of Feb. 23, 1893, as follows: " The bill which you so kindly sent me is, of course, of great interest to yourself, inasmuch as it contemplates the introduction of baths for which you have fought so long and so valiantly. However, to my mind, this bill is full of defects."

These were pointed out clearly by Dr. Bryant, and were transmitted by Dr. Baruch to Mr. Kempner, who expressed a desire to correct them as far as political exigencies permitted. As the law required the approval of such legislative act by the Mayor, Dr. Baruch appeared before Mayor Gilroy on March 13, 1893, in favor of this bill. The New York Herald of March 14, 1893, said: " Will Mayor Gilroy lend his influence in favor of Assemblyman Kempner's bill for the establishment of six permanent Public Baths in this city? Many physicians in the city have favored the bill, and yesterday Dr. Simon Baruch, of 51 West 70th Street, argued long and earnestly on the subject. The Mayor was not specially impressed. He said he believed there was no public sentiment in favor of such baths."

The Evening Telegram, Mail and Express, and Herald favored the plan, but the Mayor remained obdurate. The result was that this bath bill, when heard in the committee, was bitterly opposed by the city authorities. Mr. Kempner wrote on April 10: " Our bill may be considered dead. There is no possibility of having any action taken upon it. I expect a different kind of a legislature here next year."

The expectation of this astute politician was happily realized when the new legislature assembled in 1894. Mr. Goodwin Brown now prepared a mandatory bill providing for Public

Baths, taking the precaution to make it apply to all large cities, and thus frustrating the hitherto reported objections of the Mayor.

From correspondence between Mr. Brown and Dr. Baruch, it appears that the latter amended the bill, which had been sent to him for suggestions, to read as follows:

The People of the State of New York, represented in Senate and Assembly, do enact as follows:

Section 1. Chapter four hundred and seventy-three of the laws of eighteen hundred and ninety-two, entitled "An act to establish free public baths in cities, villages, and towns," is hereby amended so as to read as follows:

Section 1. All cities of the first and second class shall establish and maintain such number of public baths as the local Board of Health may determine to be necessary; each bath shall be kept open not less than fourteen hours for each day, and both hot and cold water shall be provided. The erection and maintenance of river or ocean baths shall not be deemed a compliance with the requirements of this section. Any city, village, or town having less than fifty thousand inhabitants may establish and maintain free public baths, and any city, village, or town may loan its credit or may appropriate of its funds for the purpose of establishing such free public baths.

Sec. 2. This act shall take effect immediately.

The skillful management of this bill by Mr. Brown and his able coadjutor in the Assembly, Mr. George W. Hamilton, (who, by the way, is not the Mr. Hamilton who so ably conducted the erection of the People's Baths,) secured its passage and approval.

On the 19th of April, 1895, Mr. Goodwin Brown wrote to Dr. Baruch as follows: "It affords me pleasure to inform you that the Governor yesterday, April 18, signed the bill to establish and maintain free Public Baths in all cities of the first and second classes: cities of 50,000 inhabitants and over. I expected it would meet with opposition in the Governor's office on the ground that it was mandatory legislation. I am delighted to say, however, that the Governor and his advisers showed themselves exceedingly broad and liberal minded, and the Governor did not need any urging to promptly approve the measure.

"It affords me pleasure to say that the matter which you gave me enabled me to lay before the committee unanswerable argu-

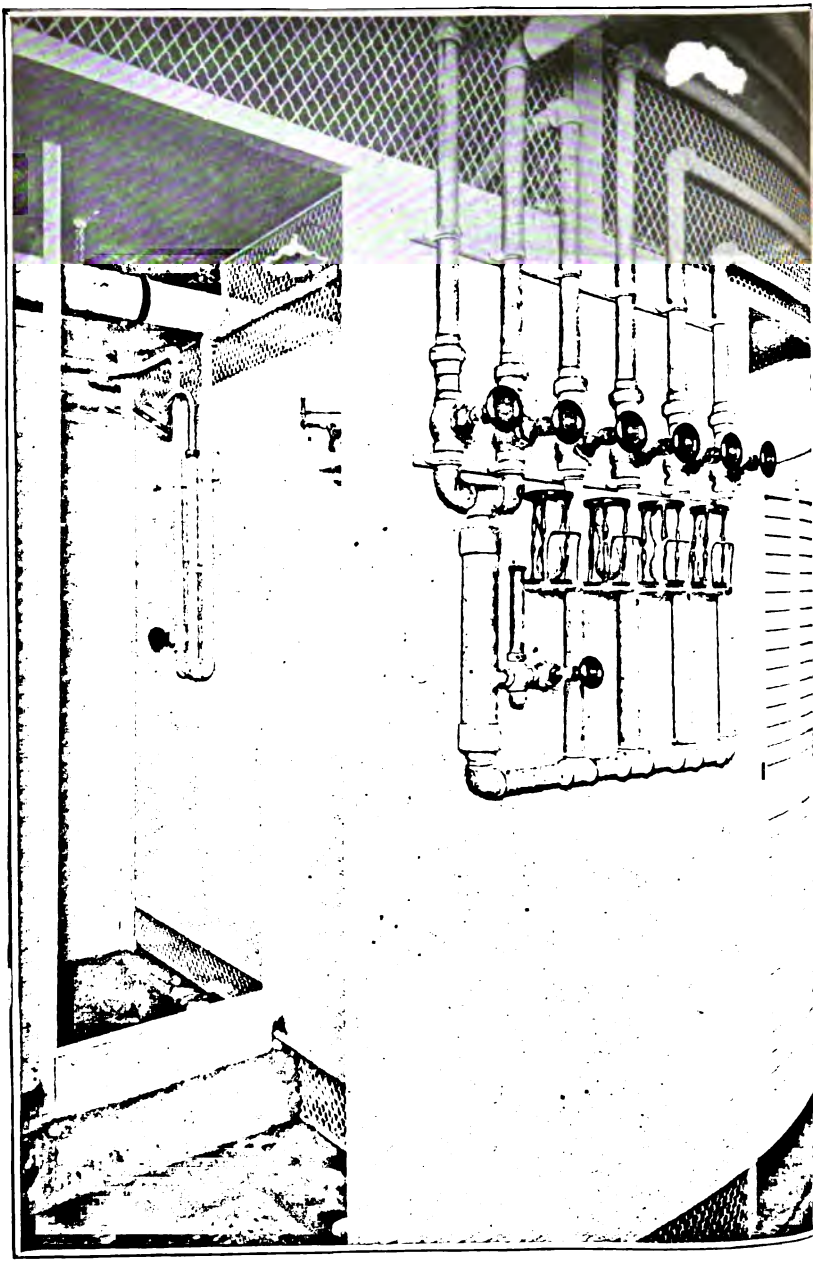


FIG. B.

ments, and to you I largely ascribe the credit of the most important measure of the session."

Thus the battle was won, and now it is the paramount duty of the city authorities, and especially of the Boards of Health in this State, to execute this law.

### THE RIVERSIDE RAIN BATHS.

A brief description of the most recently constructed Public Bath in this city will serve to illustrate this subject and perhaps be useful as a model to Boards of Health and others who contemplate the construction of such baths.

The Riverside Association, a chartered body associated for the purpose of assisting the poor to better conditions, maintains, besides its other features, (Library, Kindergarten, Gymnasium, Boys', Women's, and Girls' clubs for amusement and instruction, and a Penny Provident fund,) a Public Bath.

FIG. A.

The Bath consists of three sections: Rain Baths, Turkish Baths, and a Hydriatric department. These baths have been used by over 34,000 bathers since they were opened, in February, 1895.

Perspective of Riverside Bath.

The Rain Baths, being the chief of them, are situated in the basement of the Association House, and occupy a space of

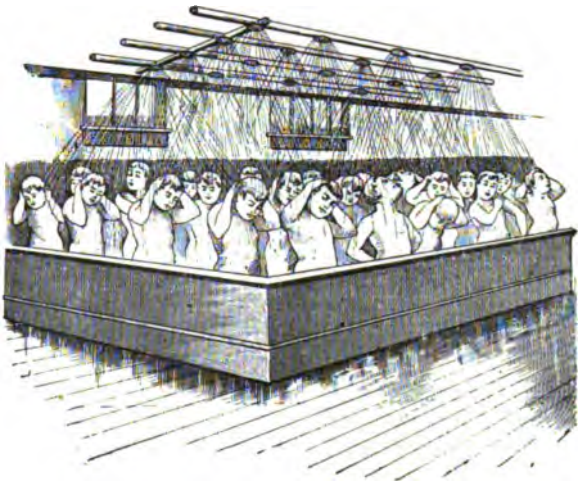


FIG. E.

22x68.5 feet. The boiler room is under the sidewalk, 14.5 feet deep, and 22 feet wide. The bathing cabinets, laundry, drying room and lavatory occupy a space of 22x54 feet. A water closet is provided; also a lavatory, with four marble basins and two self-cleansing slate urinals. Thirteen bathing compartments furnish the actual bathing facilities. Each one of these is 6 feet 7 inches by 8 feet 1 inch, divided by a partition 6.5 feet high and 2 feet wide, and a door 4.5 feet high and 2.5 feet wide, the front portion for undressing and the other for bathing.

Thirteen bathing compartments furnish the actual bathing facilities. Each one of these is 6 feet 7 inches by 8 feet 1 inch, divided by a partition 6.5 feet high and 2 feet wide, and a door 4.5 feet high and 2.5 feet wide, the front portion for undressing and the other for bathing.

The floor of the latter is formed into a cement basin 8 inches deep, as shown in Fig. A.

These baths were used by 28,000 bathers last year. The Rain Baths, being the chief of them, are situated in the basement of the Association House, and occupy a space of 25x68.5 feet. The boiler room is under the sidewalk, 14.5 feet deep, and 20 feet wide. The bathing cabinets, laundry, drying room and lavatory occupy a space of 20x54 feet. A water closet is provided; also a

lavatory, with four marble basins and three self-cleansing slate urinals.

The construction of the open compartment may be gathered from Fig. B. (the door of the front dressing room being open.)

It represents the Bath for boys introduced by him in the New York Juvenile Asylum, where 180 children are bathed each hour in the same bathing space, which bathed only 80 per hour before the conversion of the pool bath into a Rain Bath. The quantity of water is one-eighth that formerly used in the pool.

The enormous advantage of the Rain Bath over the pool is also well illustrated by the Riverside Association Bath, where, in a space of 68x25 feet, every facility is offered for bathing 400 persons per day with a small staff of attendants. To obtain facilities for 400 baths in a pool of clean warm water would tax a building occupying 100 times the space; would consume eight times more water and heat; would be less safe and agreeable from close contact of bathers, and after all would be inadequate for thoroughly cleansing people who are soiled by their occupation.

Even small cities could readily construct such a bath in any of its public buildings, and thus provide the means of preserving the health of its wage earners and prevent loss of labor and money far in excess of such an hygienic enterprise.

A new era has thus been inaugurated for the furtherance of personal cleanliness among that portion of the community which most urgently requires it. It remains for Sanitarians, Philanthropists, and Boards of Health to bring the economy and other advantages of this method of bathing to the notice of city officials in order that the latter may more perfectly fulfill their duties of doing the greatest good to the largest numbers.

While this article was passing through the press a public hearing was had before Mayor Strong on Public Baths and Lavatories, to be erected in this city. On this occasion Mr. William Gaston Hamilton, the worthy chairman of the Mayor's Committee on Public Baths, gracefully referred to the indebtedness of the community to Dr. Baruch for having inaugurated the Public Rain Bath movement. The new bath will be erected in Tompkins Square, with accommodations for one million bathers annually.

A perspective of the entire bathing space is furnished.*

The compartments are built of corrugated iron, which is

*For these illustrations I am indebted to Mr. Frank Richter, who designed and constructed the hydraulic and thermic apparatus of the baths.

painted with white enamel, giving a clean, durable and cheerful effect. The aisle is floored with mosaic tile, and is well lighted by gas, as are the compartments. Ventilation is furthered by a fan driven by a gas engine.

The temperature of the water is regulated by the attendant in the aisle, but the bather may obtain as much cold water as he desires from an independent supply pipe.

This arrangement prevents waste of hot water. The cloth and rubber curtains used in other baths are avoided, the iron partitions and doors being substituted to insure cleanliness and prevent contagion. Tubs are also conspicuous by their absence for the same reason.

The attendance required for this model bath is very small. A cashier to deliver tickets, one male and one female attendant, comprise the staff. These have other duties in the institution, and do not, therefore, devote all their time to the Baths. Six hundred bathers daily could probably be attended by the same staff without difficulty.

That the value of the Rain Bath is being rapidly recognized, is demonstrated by the fact that the Kings County Penitentiary and other reformatory institutions have adopted it. An illustration of a bath adapted to large institutions is furnished by Fig. E, which is copied from Dr. Baruch's article on Hydrotherapy and Mineral Springs in Hare's System of Therapeutics.

FINANCES.—A physician, who is noted for a vein of dry humor and wit, as well as his attainments in medical science, related the following, which is quite apropos in these times of bank suspensions and scarcity of the circulating medium.

Seated in his office, thinking seriously of the large accumulation on the debit side of his ledger, without appropriate entries on the other side, there entered a dusky daughter of Africa, and the following conversation took place:

Dinah—Doctor, I've come to see if yer can't do sometin' for this swellin'.

Doctor—Does it give you any pain? Does it hurt you any?

Dinah—Oh! No, sir; it don't hurt at all. I'm jest gettin' all swelled up here (putting her hands on the lower part of her abdomen), and I think I can feel somethin' movin' 'round in dar.

Doctor—Well, er, what is the state of your *finances?*

Dinah—Oh! Dey's done all stopped; haben't seed nuffin' of 'em fer five or six months.—*Medical and Surgical Reporter.*

# WHAT IS "AERATED BREAD" AND HOW DOES IT DIFFER FROM OTHER RAISED BREAD?

By Prof. E. H. S. Bailey, University of Kansas.

The so-called "staff of life" is usually made from wheat or rye flour raised by the action of yeast, but there is, of course, another and earlier form of bread, known as unleavened bread, and of which we have examples in the "corn pone" of the South and the "hard tack" of the Army. This latter variety of bread, however, has never been characterized as a delicate article of food, whatever may be said as to its wholesomeness.

## RAISED OR LEAVENED BREAD.

In all the cereals there is a large amount of starch, as, for instance, it is found by analysis that wheat flour contains 62 per cent. of starch, rye flour 55, oat flour 56, and corn flour 55 per cent. There is also present in these grains a quantity of nitrogenous or albuminous material, and a little sugar, fat and mineral matter. It is fortunate that starch is not the only component, for without the sticky material known as "gluten," a tenacious dough could not be prepared, and it would be impossible to raise the dough any more than it is possible to raise a mixture of chalk and water. When the little yeast cells are given a fair chance, that is, when the soil and temperature are satisfactory, the yeast germs will multiply with wonderful rapidity, and in doing so they use up some of the material of the flour. A part of the starch, while the fermentation is going on, is changed to carbonic acid gas and alcohol, and in the subsequent operation of baking both of these are driven off, thus raising the bread, but at the same time, of course, diminishing the weight of the loaf. This loss is estimated to be from three to six per cent. On account of this fact, and to save time, numerous plans have been devised for raising bread without the use of yeast. Without saying anything in reference to the many interesting processes in which baking powders or some substitute for them are used, my object here is to notice especially that product known as—

## AERATED BREAD.

All over London shops have been established where this bread is sold. By the courtesy of the Superintendent of the bakery, the writer recently had an opportunity to see the process of making

this bread. In 1859, Dr. Dauglish invented the process, although the original method has been much improved. This bread was also at one time in quite common use in some of the large cities of the United States, but for some reason, either because the taste of the product was not agreeable, or because the process was not a commercial success, the manufacture has been almost totally abandoned here. The operation is a very simple one, and consists practically in mixing the flour and salt with carbonic-acid water under pressure, and then, when the pressure is removed, the escaping gas puffs up the loaf.

In order to mix the carbonic acid water with the flour a strong machine is necessary to withstand the pressure.

The flour is placed in a globular vessel, which is provided with a mechanical stirrer revolving upon a horizontal shaft. There is an opening at the bottom where the dough may be taken out and another opening at the top where the flour, which has been previously salted and carefully sifted, is introduced. In connection with this mixing vessel, usually just above it, is the vessel that contains the carbonic-acid water. In the modern bakeries the liquid gas is purchased from the brewers, as it has been found that the gas that they furnish is much purer than that made from marble or chalk with the addition of acid. It is sure to be free from sulfur compounds and from acid fumes, which are so liable to be found in the gas as formerly made.

The liquid gas is allowed to mix with the water in a suitable vessel, and this water thus charged with the gas is allowed to run down into the mixing vessel; the stirrer is set revolving and in a few minutes the dough is thoroughly mixed. When the valve at the bottom is opened, the pressure of the gas crowds out the dough in a continuous stream, and this is quickly cut into loaves by the workman, and are carried directly to the oven. The only limit to the rapidity of the manufacture of the loaves is the speed with which the workman can handle them, and this is at a rate of over 400 loaves hourly. The carbonic-acid gas that is left in the apparatus when the dough is all out is allowed to run into rubber bags, and is then pumped into the water to be used with the next charge.

### BAKING.

The best results in baking have been obtained by the use of an wood in the old-fashioned brick oven. When the temperature oven in which coke is burned, just as our grandfathers burned

of the oven has been raised sufficiently for baking, after one lot is taken out there is still heat enough left in the oven to bake a second lot, and then a little wood burned in the corner of the oven will raise the heat sufficiently to bake one batch after another. The ovens are arranged in groups, so that the heat from one oven will assist in warming another, and thus great economy of fuel is secured.

The bread when baked is in the form of a loaf of two pounds weight, which retails for 3d. (six cents). This is not dear, when we consider the cost of flour in England, or when we compare it with the prices paid in the United State for ordinary bakers' bread. The aerated bread as made at this establishment has an agreeable taste and odor, though, of course, it lacks the odor and flavor of bread that contains yeast. Many people have become so accustomed to this flavor that no other is satisfactory in bread, but they do not complain at the taste of biscuit that is raised with baking powder. The bread is sweet and is covered with a rich brown crust of dextrine. By this process biscuit, cakes and pastry, as well as bread, may be made light.

There are several advantages claimed for the aerated bread over the ordinary fermented product. Among these may be mentioned, in addition to the saving of flour, as noted above, the greater cleanliness, as the kneading is done by machinery in a closed vessel, and the dough does not stand for several hours exposed to the air; greater rapidity, requiring only an hour and a half for making and baking, while the fermentation process requires at least sixteen hours; no deterioration of the flour and partial change of the starch to sugar; and, finally, the certainty and uniformity of the process. It is quite probable also that this bread is less liable to produce derangement of the digestive organs than fermented bread; at any rate, this claim is made for it by some distinguished physicians.

When we consider the fact that the object of baking is to render the starch and other ingredients of the grain readily digestible, and that in the process of making aerated bread the starch grains are broken up by the heat and the loaf is puffed up by the escaping gas, without the addition of any other substance to the flour; moreover, that no fermentation takes place—a process which, in baking, uses up some of the most nutritious of the materials of the flour—it would seem probable that many of the claims for the use of the aerated bread are well founded.

# TOPOGRAPHY, CLIMATE AND MINERAL SPRINGS OF MASSACHUSETTS.

By A. N. Bell, A. M., M. D.

Massachusetts, including islands, lies between the parallels of 41 degrees 14 minutes and 43 degrees 53 minutes north latitude, and the meridians of 69 degrees 53 minutes and 73 degrees 32 minutes west longitude from Greenwich.

The State is very irregular in form. It is bounded on the north by Vermont and New Hampshire; east by the Atlantic Ocean; south by the Atlantic and the States of Rhode Island and Connecticut, and west by Rhode Island and New York. Its greatest length from east to west is from Chatham Beach to the meridian of the west boundary of the town of Mount Washington, 180 miles; from Cape Ann to the New York State line the distance is 140 miles. Its greatest breadth from the State line of New Hampshire, at Salisbury, to the southern line of No Man's Land, or Nantucket, is 113 miles. From Worcester County, westward, its average breadth is 47½ miles.

The total area is 7,800 square miles. The surface is for the most part uneven, and portions of it are rugged and mountainous. The western, middle, eastern and northeastern sections are generally hilly and broken, and the southeastern more level and the soil sandy, though with many rocks along the coast. The Taghconic and the Hoosick Mountain ranges are separate ridges of the Green Mountain Range of Vermont. Of these the western or Taghconic is much the higher. Saddle Mountain, or Greylock, the greatest elevation in the State, 4,100 feet high, and Mount Washington, or, as it is now more generally called, Mount Everett, 2,624 feet high, both belong to this range. The Hoosick Range is a general elevation of from 1,200 to 1,600 feet, unbroken by any gap through which a railroad could be constructed, except that through which the Boston and Albany Railroad was carried, at an elevation of twelve hundred feet. The Hoosick Tunnel, six miles in length, through which the Troy and Greenfield Railroad passes, pierces the mountain at North Adams, near the Vermont line.

The Green Mountain Range, that extends through Vermont across Massachusetts and Western Connecticut, nearly to Long Island Sound, constitutes the Berkshire Hills—a region long known as a popular resort for summer tourists and justly esteemed for its healthfulness. Dr. William Henry Thayer, an accomplished observer, and thoroughly familiar with this region, fully described it in these pages two years ago. From that description the following is an abstract:

"The territory between the Connecticut and Hudson rivers presents a marked contrast in geological conditions to that east of the Connecticut River. New Hampshire and that part of Massachusetts east of the river have a granite foundation. But the Green Mountain ranges are chiefly of limestone, which gives a richness to the soil, that clothes the mountains with verdure to their tops, and furnishes throughout the county the best farming land in New England—which in many cases is improved to the utmost, in farms varying from one hundred to one thousand acres in extent, profitable and beautiful.

"The chief towns of the county (Berkshire) have naturally grown up along the valley of the Housatonic, where it winds about through the hills; from Pittsfield, near its source, through Lenox, Stockbridge, Lee, Great Barrington, and Sheffield into Connecticut. Pittsfield is the county town, and is now a city, with eighteen thousand inhabitants and the various public advantages; but this and all the other beautiful towns named have a rural character. Their charming streets and roads shaded with elms, are lined with detached houses with ornamental grounds, and every one takes pride in having them at attractive as cultivated nature can make them.

"All the towns mentioned have been a favorite summer resort for some years past; and many New Yorkers and others have built country seats there, as is well known. Lenox and Stockbridge especially are almost wholly occupied during the summer season by families from outside. The beauty of the scenery everywhere, the agreeable climate, dry and cool compared with that of New York City, and, of paramount importance, its healthfulness, furnish attractions that cannot well be surpassed.

"The good sanitary conditions come from a porous soil—thereby good drainage—and a high altitude; these towns being from one thousand to twelve hundred feet above the sea-level.

The mean temperature is therefore 10 degrees F. lower than that of the vicinity of New York City; and the superior dryness of the air increases still more the difference of sensation in winter or summer. Any one accustomed to the two climates will notice a difference of feeling between them of 20 degrees of temperature at all seasons. This is true of the climate of the interior everywhere, except in low and wet situations, as compared with that of the seashore.

"The water used in the various towns comes from mountain springs. Pittsfield has a public supply, brought by aqueduct from a lake in the neighboring town of Washington, near the top of a hill three hundred feet above the city level.

"It is hardly necessary to say that a change from the city to such a region during the summer brings health to the invalid; that it saves many lives of infants, which would inevitably have been sacrificed by a summer in the city. Every physician knows that such a change to a child already ill with diarrhoea brings restoration, which all his care in the city could not accomplish. He is carried a little way out of town, with only partial benefit; but as he is removed to a greater altitude, with its still lower temperature, health returns.

"The climate is also especially favorable to consumptives. Continued life out-of-doors in the Berkshire Hills is successful in arresting tubercular disease while in its early stage. It is a well-established fact that it flourishes mostly in low and wet situations—is cultivated by soil moisture—that under such conditions the infectious agent (*bacillus tuberculosis*) takes root in the system the most readily; and that in elevated situations, on a dry soil, it finds least encouragement for development in the system. 'The registration reports show that the mortality from consumption is less in Berkshire than in any other county of the State, being but little more than half what it is in some of the maritime counties.'

"I have thus far spoken chiefly of the southern half of the county, in which lie most of the towns named. The physical characteristics of that part north of Pittsfield are the same, but the country differs from that below in being more rural. At Pittsfield begins a distinct central range of hills, running northward, rising gradually for twenty miles, a succession of peaks, culminating at last in Greylock Mountain.

"On each side of this interior range is a continuous valley. The eastern one has a string of towns, largely manufacturing.

"The western valley is for the most part purely natural, without mills or railroads. It begins in Pittsfield and ends in Williamstown, the northwestern town in the State and the seat of Williams College. The road runs almost level through the little village of Lanesborough and scattered farms, and finally winding through a narrow valley in and out among the mountains, giving a variety of the most charming scenery. No railroad here disturbs the quiet of nature, only a farm here and there reminds you of humanity. There is not a more delightful drive in all Berkshire. Whoever wants retirement will find it here. It has not yet attracted city dwellers to settle, and the charms of nature are little disturbed by man. The drive ends in Williamstown, a village which is the outgrowth of Williams College; where a favorable situation upon a knoll in sight of Greylock—only three miles to the southeast of the town—has been improved in good taste, in its wide main street, with four rows of elms and broad greensward separating its attractive homes and college buildings.

"Communication with New York is easy by the Housatonic Railroad, which runs from the New York and New Haven Railroad at Bridgeport, Conn., through the Housatonic Valley as far as Pittsfield, passing through the chief towns already mentioned. Or, for the northern part of the county, by the Harlem Railroad to Pittsfield.

"Pittsfield, Lenox, and Stockbridge are classic ground, through association with Longfellow, Holmes, Miss Sedgwick, Hawthorne, Beecher, and others. Fanny Kemble, during a summer residence of some years in Lenox, illustrated her own peculiarities more than she illustrated the town. A good story is told of her. When she first lived in Lenox, she employed a native of the place to drive her about. He naturally began to describe the country and the people to her as they drove along. Till finally Mrs. Kemble said, in her high-tragedy manner, 'I have engaged you to drive for me, sir, and not to talk.' The farmer ceased, pursed up his lips, and in all their subsequent drives preserved his silence. At the end of the season he brought in his bill for the summer services. Running her eye down its awkward columns, she suddenly paused at something she didn't understand. 'What is this item, sir. I cannot comprehend it.' With equal gravity the farmer replied: 'Sass, $5. I don't often

take it, but when I do, I charge.' Mrs. Kemble paid the bill without further comment."

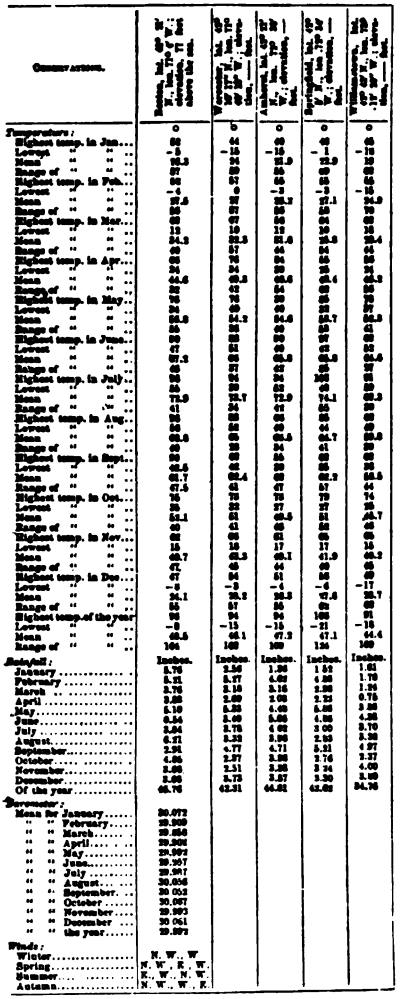
Further east, near the west bank of the Connecticut River, are two isolated mountain peaks—Mount Tom and Sugarloaf—the former 1,214 feet high, and across the beautiful valley of the Connecticut, Mount Holyoke, 910 feet; still further east is Wachusett Mountain, in the township of Princeton, Worcester county, rising to the height of 2,480 feet. This region has long been an attractive and popular summer resort for tourists, and deservedly so, for the beauty of the scenery and its freedom from unhealthful conditions. Its beauty is enhanced by Lake Wachusett, which nestles under the shadow of the village of Princeton, occupying an elevated situation amidst beautiful scenery, an abundant supply of pure water from mountain springs and streams, and an invigorating atmosphere. Indeed, the whole valley of the Connecticut River in Massachusetts is remarkable for the beauty of the landscape and for its healthfulness.

The eastern and southeastern part of the State, including the island counties and Cape Cod, is moderately level and sandy. The most elevated portions are well drained and the summer climate salubrious.

The *coast* is deeply indented by large bays, harbors and sounds, the largest of these, beginning with the southeast, are Buzzard's Bay, which is almost landlocked by the Elizabeth Islands, and has many small bays and harbors on its northwest shore; Vineyard Sound, between the Elizabeth Island and Martha's Vineyard; Edgartown and Nantucket harbors, Cape Cod Bay, three-fourths landlocked; Wellfleet Bay, Plymouth Harbor, Duxbury Bay, Massachusetts Bay, and within it Boston harbor, Lynn harbor, Nahant Bay, Marblehead, Salem and Beverley harbors, Gloucester Bay, Sandy Bay, and Annisquam harbor. There are hundreds of islands along the coast, mostly small, but Martha's Vineyard, Nantucket and several of the Elizabeth group are of good size, the two former constituting each a county by itself. On Peniske Island, one of the smallest of the Elizabeth group, the Anderson School of Natural History, established by Prof. Agassiz, was situated.

The principal Rivers of the State are the Connecticut, which has a course of more than fifty miles through the centre of the State; the Housatonic, with its affluents, which has its sources among the Taghconic and Hoosick ranges in the north-west; the

Agawam or Westfield, and the Deerfield, tributaries of the Connecticut from the west; and the Chicopee, with several branches and Miller's River, eastern tributaries of the same river; the Merrimack, which has its source in New Hampshire, but flows for thirty-five miles to its mouth in Massachusetts, receiving in the State the Nashua and Concord rivers, and furnishing vast water power for the manufacturing towns of Lowell, Lawrence, Haverhill, etc.; the Charles River, Taunton River and its branches, and the Blackstone River, which, like the others, furnishes a large amount of water-power. None of these rivers is navigable within the State, except the Connecticut for a few miles, and the Merrimack below the falls.



There are no large Lakes in the State, but numerous small ones, especially in the southeast and southwest portions. Wenham Lake, famous for its ice, is near Boston, and Quinsigamund Lake, not far from Worcester.

The *Climate* throughout the State, excepting a few summer months, is cool or cold. The winters are generally severe, the summers short and warm. Snow falls usually in five or six months during the year, and sometimes in more than six months. The annual rainfall is from 40 to 43.5 inches, and very equably distributed through the seasons. As a whole, the climate

is well characterized by the table herewith, carefully compiled from the recorded observations for a series of years at the different stations named between the extreme eastern and western limits of the State.

*The Mineral Springs* of Massachusetts are exceptionally rare for the extent of the area. The whole number of localities up to the time of the issue of Census Bulletin on Mineral Waters, May 2, 1891, being but twenty-six. Though " Professor Hitchcock, in the reports on the Geology of Massachusetts, 1833-1849, says that chalybeate springs are common throughout the State, occurring in nearly every town, usually rising in low ground containing bog iron."*

The analyzed mineral springs are as follows:

Allandale Spring, West Roxbury, Suffolk County.
William Ripley Nichols, analyst.
*Indifferent.*

| | | | |
|---|---|---|---|
| Sodium carbonate, | grains per gallon | ..... | 0.03 |
| Magnesium carbonate, | " " | ..... | 0.40 |
| Calcium carbonate, | " " | ..... | 0.70 |
| Iron carbonate, | " " | ..... | 0.02 |
| Sodium sulphate, | " " | ..... | 0.37 |
| Potassium sulphate, | " " | ..... | 0.15 |
| Sodium chloride, | " " | ..... | 0.38 |
| Silica, | " " | ..... | 0.37 |
| Organic matter, | " " | ..... | 0.29 |
| Water of hydrogen, | " " | ..... | 0.39 |
| Total | " " | ..... | 3.30 |

Bethlehem Spring, Worcester Co., near Braggville.
E. Cornell Esten, analyst.
*Indifferent.*

| | | | |
|---|---|---|---|
| Sodium carbonate, | grains per gallon | ..... | 0.27 |
| Magnesium carbonate, | " " | ..... | 0.55 |
| Calcium carbonate, | " " | ..... | 0.60 |
| Iron carbonate, | " " | ..... | 0.07 |
| Lithium bicarbonate, | " " | ..... | 0.03 |
| Sodium sulphate, | " " | ..... | 0.33 |
| Potassium sulphate, | " " | ..... | 0.14 |
| Sodium chloride, | " " | ..... | 0.31 |
| Silica, | " " | ..... | 0.52 |
| Organic matter, | " " | ..... | 0.27 |
| Water of hydrogen, | " " | ..... | 0.39 |
| Total | " " | ..... | 3.48 |

*Bulletin U. S. Geological Survey, No. 32.

Echo Grove, Mineral Springs, Lynn, Essex Co.
No. 1. S. Dana Hayes, analyst.
*Saline.*

| | | |
|---|---|---|
| Sodium bicarbonate, | grains per gallon | 0.10 |
| Magnesium bicarbonate, | " " | 0.76 |
| Calcium bicarbonate, | " " | 1.38 |
| Potassium sulphate, | " " | 0.41 |
| Sodium chloride, | " " | 0.99 |
| Silicic acid in solution, | " " | 0.37 |
| Iron, Alumina | | traces. |
| Total | " " | 4.01 |

No. 2. Charles R. Fletcher, analyst.
*Calcic-saline.*

| | | |
|---|---|---|
| Sodium carbonate, | grains per gallon | 0.79 |
| Magnesium carbonate, | " " | 1.43 |
| Calcium carbonate, | " " | 4.27 |
| Potassium sulphate, | " " | 0.07 |
| Sodium chloride, | " " | 1.18 |
| Silicic acid in solution, | " " | 0.67 |
| Iron, Alumina | | traces. |
| Total | " " | 8.41 |

Commonwealth Mineral Spring, Waltham, Middlesex Co.
S. Dana Hayes, analyst.
*Indifferent.*

| | | |
|---|---|---|
| Sodium bicarbonate, | grains per gallon | 0.501 |
| Magnesium bicarbonate, | " " | 0.181 |
| Calcium bicarbonate, | " " | 0.447 |
| Potassium sulphate, | " " | 0.611 |
| Sodium chloride, | " " | 0.340 |
| Silicic acid in solution, | " " | 0.370 |
| Iron, Alumina | | traces. |
| Total | " " | 2.450 |

Coldbrook Springs, Worcester Co.
No. 1. A. A. Hayes, analyst.
*Alkaline-sulphurous.*

| | | |
|---|---|---|
| Silicic acid in solution, | grains per gallon | 1.27 |
| Lime, | " " | 0.31 |
| Magnesia, | " " | 0.26 |
| Potash and soda, | " " | 1.48 |
| Chlorine, | " " | 0.41 |
| Sulphur, sulphuric acid, | " " | 0.70 |
| Crenic acid, | " " | 2.20 |
| Organic matter, | " " | 0.69 |
| Water of hydrogen, | " " | 24.28 |
| Total | " " | 31.60 |

No. 2. A. A. Hayes, analyst.
*Chalybeate-sulphurous.*

| | | | |
|---|---|---|---|
| Silicic acid in solution, | grains per gallon | ..... | 1.11 |
| Iron oxide, | " " | ..... | 0.82 |
| Potash and soda, | " " | ..... | 0.50 |
| Sulphur, sulphuric acid, | " " | ..... | 0.22 |
| Crenic acid, | " " | ..... | 1.20 |
| Organic matter, | " " | ..... | 0.31 |
| Water of hydrogen, | " " | ..... | 16.64 |
| Total | " " | ..... | 20.80 |

Everett Chrystal Spring, Everett, Middlesex Co.
Samuel Cabot, Jr., analyst.
*Indifferent.*

| | | | |
|---|---|---|---|
| Calcium bicarbonate, | parts per 1000 | ..... | 0.0213 |
| Calcium sulphate, | " " | ..... | 0.0350 |
| Sodium chloride, | " " | ..... | 0.0060 |
| Magnesium chloride, | " " | ..... | 0.0342 |
| Silica, | " " | ..... | 0.0160 |
| Albuminoid ammonia, | " " | ..... | 0.0001 |
| Volatile matter (on ignition), | " " | ..... | 0.0530 |
| Iron ..... | | | trace. |
| Total | " " | ..... | 0.1656 |

And the following, with no published analysis:

Adams Springs, Adams, Berkshire County.

Belmont Springs, Everett, Middlesex County.

Berkshire Soda Springs, near Great Barrington, Berkshire County.

Brookfield Spring, Brookfield, Worcester County.

Chrystal Mineral Springs, Stoneham, Middlesex County.

Deerfield Springs ("Chalybeate"), Deerfield, Franklin County.

Hopkinton Springs, Hopkinton, Middlesex County.

Mendon Mineral Springs, Mendon, Worcester County.

Pittsfield Spring, Berkshire County.

Sheep Rock Spring, Lowell, Middlesex County.

Simpson Spring, Bristol.

Shutesbury Mineral Springs, Shutesbury, Franklin County.

South Hadley Spring ("Chalybeate"), South Hadley, Hampshire County.

Springs:

Near Mount Washington, Berkshire County.

Two miles south of Hinsdale, Berkshire County.

Five miles south of Williamstown, Berkshire County.

Two miles northeast of North Brandford, Hampden County.

Undine Spring, Brighton, Suffolk County.

West Medway Spring, West Medway, Norfolk County.

# DR. EDWARD JENNER AND THE HISTORY OF HIS DISCOVERY OF THE PROTECTIVE VALUE OF VACCINATION.

Abstract of Address Read at the Centennial Anniversary, Atlanta, Ga., May, 1896.

By N. S. DAVIS, M.D., LL.D.

According to reliable authorities the subject of this address, Edward Jenner, was a native of Berkeley, in Gloucestershire, England. He was born May 17, 1749. His father was the Rev. Stephen Jenner, who was rector of Rockhampton and Vicar of Berkeley. He was the representative of an honorable family long established and owning some landed property in that county. His mother belonged to an ancient family in Berkshire. The father died when Jenner was only 6 years old, thereby leaving the care and education of Edward almost wholly to his older brother, the Rev. Stephen Jenner, who appears to have assumed and executed all the parental duties relating to the younger brother with the utmost fidelity and tenderness. The early education of Edward was in the schools, chiefly at Wotten-under-Edge and Cirencester. During this time he developed so much fondness for natural history as to attract special attention; yet he was never behind in any other studies required. At the age of 14 it was decided that his further education should have direct reference to his entering the medical profession. Consequently he was apprenticed to Mr. Daniel Ludlow, a surgeon at Sudbury, near Bristol, for the purpose of studying surgery and pharmacy. It was during this apprenticeship that he heard a young woman, a milkmaid of the neighborhood, say to Surgeon Ludlow that she could not have the smallpox because she had previously had a cowpox sore on her hand contracted while milking. The remark was such as to indicate a prevalent belief among some of those engaged in milking, that there sometimes existed on the udders of the cow a sore or pustule the matter from which, if placed in contact with an abrasion on the hand of the milker, produced a peculiar sore, leaving a permanent scar and rendering him or her ever after immune to the contagion of smallpox. No attention was given to the remark by the surgeon, who, like all his confrères, regarded it as either a mere accidental occurrence

or a superstitious vagary of the common people. But it was far otherwise with his young apprentice, Edward Jenner.

Endowed with the highest order of mental acumen, coupled with an equally high order of benevolence, and already trained to philosophical study, the simple remark of the milkmaid at once and indelibly fixed in his mind the question whether it did not point to a possible preventive of that most dreaded scourge of the human race, smallpox. Jenner never abandoned the idea of solving the question until he had completed its solution thirty years later. But with no accurate description of the alleged infectious sore or pustule on the cow's udder, and the fact that it was met with only at irregular intervals, he was limited during his apprenticeship to the gathering of such items of information bearing on the subject as might come within his reach. In the meantime he not only pursued his studies in surgery and pharmacy with diligence, but he seems to have devoted every available hour to further studies in natural history directly in the open field of nature, observing the habits of living animals, gathering fossils, and acquiring unusual skill in drawing. At the expiration of his seven years of apprenticeship with Surgeon Ludlow, in 1770, at the age of 21 years, he went to London for the further prosecution of his medical studies. He entered as a student at St. George's Hospital and became a private pupil of the celebrated John Hunter, in whose family he resided during the next two years. During this pupilage he early displayed so much skill and accuracy in making preparations of anatomy and natural history, and in dissecting delicate structures, both natural and pathologic, that he rendered much aid to his preceptor. So marked were these attainments that through the recommendation of Mr. Hunter he was employed by Sir Joseph Banks to arrange the valuable specimens, zoological and otherwise, gathered by Captain Cook during his first voyage of discovery, ending in 1771. He performed the work so satisfactorily that he was offered the position of naturalist to the next expedition the following year. But his attachment to his older brother and to his native town caused him to decline this offer, and at the end of two years' study in London he obtained the necessary license to practice surgery, and returned to practice in his native town of Berkeley at the beginning of 1773. While with Mr. Hunter, young Jenner mentioned his question of the possibility of making the cowpox a valuable preventive of the natural smallpox, and subsequently corresponded

with him on the subject. He was encouraged to make a thorough investigation, which he entered upon earnestly in 1775, or as soon as he had become established in the practice of his profession.

The first five years were consumed in fairly identifying the true cowpox vaccine pustule and separating it from other sores with which it had been confounded. During the same time his investigations led him to believe the true cowpox pustule yielded its active virus only at a certain stage of its advancement and that it, together with the diseases known as swinepox and the grease in horses, were all derived from the action of smallpox contagion on these animals. So firm was his belief in the truth of this, that during a period of unusual absence of cowpox from the neighborhood, he ventured to vaccinate his oldest son with the matter of swinepox and produced in him all the symptoms of a very mild case of smallpox. After his recovery he was inoculated with genuine smallpox without effect. This gave him so much confidence in the ultimate success of his investigations that in 1780 he communicated confidentially to his intimate friend, Edward Gardner, the progress he had made and his confident belief that its results would be of the greatest benefit to the human race. In 1788 he carried an accurate drawing of the cowpox sore as seen on the hand of a milkmaid to Sir E. Home and others in London, who seemed to regard it as a curious and interesting illustration, but gave no evidence of perceiving its practical importance.

Finally, on the 14th of May, 1796, the long-sought opportunity came, and he was enabled to take the lymph from a cowpox pustule on the hand of Sarah Nelmes, and with it vaccinate the arm of James Phipps, a boy in good health, and aged 8 years. The vaccine disease passed through its successive stages perfectly, and Jenner was surprised at the general resemblance of the vaccine sores to those of smallpox. About twenty days after the boy Phipps had recovered from his vaccination, his arms were inoculated with smallpox matter without effect. The circle of proof was now complete. The vaccine lymph from the cowpox sore produced the characteristic vaccine on the hand of the milkmaid. The lymph from the vaccine sore on her hand produced the characteristic vaccine sore on the healthy boy, and both proved ever after entirely immune to the contagion of smallpox. Still Dr. Jenner patiently continued two years more in extending and

verifying his proofs that there might be no reasonable chance of failure in the complete establishment of his great discovery. He then, early in 1798, wrote in a paper frankly all the important steps of his investigations and the full proofs of his discovery and its inestimable value to the human race, intending to submit it as a communication to the Royal Society, to which he had previously made acceptable communications on other subjects. But we are told by Dr. John Baron, the chosen biographer of Dr. Jenner, that the President of that Society, Sir J. Banks, advised him to be very cautious, lest such a paper should lessen the reputation he had already gained. Accordingly, Dr. Jenner, with a supply of vaccine lymph, went to London for the purpose of directly demonstrating its effects to prominent members of the profession in that city. After tarrying there two or three months without finding a single individual who would submit to the simple process of vaccination, near the end of June, 1798, his paper was given to the world in an unpretentious pamphlet dedicated to his friend Dr. Parry of Bath, and he returned to his home in Berkeley. He, however, left with Mr. Cline, of St. Thomas's Hospital, a supply of the vaccine lymph, and this eminent surgeon soon found an opportunity to insert some of the same into the hip of a boy complaining of hip-disease. It was done under the plea of creating necessary counter-irritation, and perfect vaccine sores resulted therefrom. After fully recovering from the vaccination the boy was inoculated in three places with active smallpox matter without producing any of the symptoms of that dreaded disease. With this marked demonstration Mr. Cline became an active advocate of Jenner's discovery, and there was no longer difficulty in finding either physicians or patients willing to practically test its value.

Indeed, in less than twelve months after the publication of Dr. Jenner's pamphlet, a manifesto fully endorsing the truthfulness and value of his discovery was published, signed by seventy-three of the most eminent members of the medical profession in London. Within the same period of time the practice of cowpox vaccination was introduced into this country by Dr. Benjamin Waterhouse, Professor of Physic at Cambridge, Mass., who vaccinated members of his own family; and the practice spread rapidly throughout the United States. Under the judicious leadership of Dr. de Carro, of Vienna, the practice of vaccination was rapidly introduced into all the countries of central and southern Europe.

In Spain it was warmly welcomed by both physicians and clergy, by whom a knowledge of it was rapidly communicated to all her colonies on this side of the Atlantic. In Russia the cause of Dr. Jenner found an efficient advocate in the Empress, who introduced the practice of vaccine in her own family and facilitated its extension to Siberia and the countries of Asia. lated into nearly every language in Europe. And within six years the practice of vaccination for the prevention of smallpox had been introduced and sanctioned in every civilized and even semi-civilized country on the globe.

Such is a simple narrative of the inception, patient prosecution, and final completion of the great discovery of the true cow-pox lymph and its efficacy as a preventive of smallpox by Dr. Edward Jenner. And thus was the result of more than twenty years of thoughtful, skillful, persevering investigations given to the world with the utmost freedom and truthfulness. It was accompanied by no fictitious names, no unexplained processes, and no hint at selfish or pecuniary recompense. On the contrary, he was among the most zealous in extending its benefits to all classes, and especially to the poor. And he apparently looked only for the fulfillment of Lord Bacon's saying: "It is heaven upon earth, to have a man's mind move in charity, rest in Providence, and turn upon the poles of truth." While it is true that Dr. Jenner's discovery was received and adopted both by the medical profession and the masses of the people of all civilized countries with the extraordinary rapidity just described, it was not without the bitter opposition of some persons and the injurious effects of a few overzealous or injudicious friends.

To correct the errors and misstatements of these and to furnish additional facts of value, Dr. Jenner published a paper entitled: "Further Observations on Variolea Vaccinae, London, 1799"; another on "A Continuation of Facts and Observations Relative to the Variolae Vaccinae, London, 1800," and the same year "A Complete Statement of Facts and Observations Relative to the Cow-Pock," followed by another "On the Origin of Vaccine Inoculation, London, 1801." But in no one of these additional publications did he exhibit the ordinary spirit of controversy.

All were characterized by the highest degree of candor and regard for truthfulness, and he continued the practice of his profession in his native town regardless of the most flattering

inducements to change his residence to London. In 1788 he had married Miss Catherine Kingscote, a lady admirably qualified to add to his social and domestic happiness. In 1792, wishing to lessen the pressure of his professional practice by changing its direction, he obtained from the University of St. Andrews the degree of Doctor of Physic. However, he not only continued a lucrative pratice and actively maintained a social organization of his neighboring practitioners, but he also continued to give so much attention to studies in natural history that he was in 1788, or soon thereafter, elected a member of the Royal Philosophical Society of London. Notwithstanding all these proofs of his love of home, of domestic happiness, of nature in her native garb, and above all, of nature's God, during the few years immediately following the publication of his discovery, he was overwhelmed with correspondence from every quarter, to such an extent that, in his own expressive language, he was forced to become "Vaccine Clerk for the World." In addition to this, congratulatory communications came to him from kings, queens, officers of state, and of learned societies, until he soon found himself elected to membership in nearly all the scientific societies in Europe. If we add to all these time-consuming topics, that he continued to devote a certain amount of time each day to the gratuitous vaccination of the poor at his own home, we shall see that his time for pursuing the paying part of his professional pratice was seriously impaired. This did not escape the observation of his neighbors and most intimate friends, who near the close of 1801 presented him as a testimonial, a service of plate, which was designed, in reality, as a prelude to the obtaining of his consent to a petition to Parliament for a suitable grant of money. Such a petition was presented on the 17th of March, 1802, and was referred to a committee of which Admiral Berkeley was chairman. After proper investigation, the committee reported favorably and Parliament voted a grant of $50,000. Four years later, 1806, after the Royal College of Physicians had reported favorably on the continued success of vaccination, Parliament voted an additional grant of $100,000. Five or six years later still, subscriptions were taken up in the East, and those forwarded from the three Presidencies of Bengal, Bombay, and Madras, aggregated little more than $35,000.

In 1808 Dr. Jenner was elected a Corresponding Member of the National Institute. Subsequently he was elected Mayor of

Berkeley, and in 1813 he was granted the degree of Doctor in Physic by the University of Oxford, by special decree of the Convocation. His otherwise most happy domestic life received its first shade of sadness from the death of his oldest son in 1810, leaving him still one son and one daughter. But the deeper sorrow came Sept. 13, 1815, when Mrs. Jenner, after a protracted sickness, died. From this time Dr. Jenner lived in practical retirement, having made his last visit to London the year previous, when he was presented to the allied sovereigns and many other distinguished persons then assembled in that city. Though in practical retirement during the last eight years of his life, he not only found serene enjoyment in the fields and groves of his native town, but sufficient occupation also in still gathering facts concerning the results of vaccination, particularly as connected with other cutaneous eruptions, and in discharging the duties of physician, naturalist, and magistrate.

He published his last paper in 1822, "On the Influence of Artificial Eruptions in Certain Diseases." His last written expression concerning the general subject of vaccination was found on the back of a letter dated Jan. 14, 1823, and is copied by his biographer, Dr. Baron, as follows: "My opinion of vaccination is precisely as it was when I first promulgated the discovery. It is not in the least strengthened by any event that has happened, for it could gain no strength; and it is not in the least weakened, for if the failures you speak of had not happened the truth of my assertions respecting those coincidences which occasioned them, would not have been made out."

Dr. Jenner is reported to have had a mild attack of apoplexy Aug. 6, 1820, from which he quickly recovered. Another and severe attack came suddenly on the morning of Jan. 25, 1823, from which he died the following morning in the 74th year of his age. His body was buried in the chancel of the parish church of Berkeley, Feb. 3, 1823, in the presence of a large concourse of people.

But my task would be inexcusably defective did I not add to the simple history of the truly great discovery of the protective power of cowpox vaccine virus, some comments on the personal character of the discoverer himself. For, if we may credit the combined testimony of his chosen and most competent biographer, D. John Baron, and his contemporaries, the character of Dr. Edward Jenner is one of the most interesting and re-

markable to be found on the records of medical history. Born in a quiet country town, of parentage of intelligent and high moral or religious qualities, and spending his childhood and youth under the same influences in the midst of his native groves and meadows, it was natural that he should develop a passionate love of nature and a marked reverence for nature's great Architect. And receiving his general education, not in the higher colleges or universities, but in the more quiet though excellent local schools near his parental home, still further tended to foster that fondness for the study of natural history and, indeed, all the natural sciences in which he became proficient in after life. No other environment or influences could have been better calculated to develop into unusual prominence the three most remarkable traits in the character of Dr. Jenner, namely, his love of nature and all that is truthful and good, his benevolence or unselfish desire to prevent or relieve human suffering, and his patient and persevering pursuit of whatever promised to result in material benefit to mankind. The last-named element of his character has been amply illustrated by what has already been said of his more than twenty years of earnest pursuit of a reliable preventive of smallpox, regardless of the indifference of his professional brethren generally, and of the positive jeers of some of those most nearly in association with him. His love of nature and genuine reverence for the author of all good is admirably illustrated in a letter to a friend written when the evidences of the genuineness of his discovery were nearing completion. He says: "While the vaccine discovery was progressive, the joy I felt at the prospect before me of being the instrument destined to take away from the world one of its greatest calamities, blended with the fond hope of enjoying independence and domestic peace and happiness, was often so excessive, that in pursuing my favorite subject among the meadows, I have sometimes found myself in a kind of revery. It is pleasant to me to recollect that these reflections always ended in devout acknowledgments to that Being from whom this and all other mercies flow."

But the most vivid illustration of Dr. Edward Jenner's unselfish nature and of his noble conceptions of the true objects of human life is found in his answer to the most tempting inducements to leave his native town and enter upon a professional contest for wealth and fame in the great city of London. We are assured by his biographers that after the full demonstration

of the truth of Dr. Jenner's discovery by Mr. Cline, the latter urged him to settle in London, promising him £10,000 ($50,000) per annum as the result of his practice.

To this, however, his deliberate reply was: "Shall I, who even in the morning of my days sought the lowly and sequestered paths of life, the valley and not the mountain; shall I, now my evening is fast approaching, hold myself up as an object for fortune and fame? Admitting it as a certainty that I obtain both, what stock should I add to my little fund of happiness? My fortune, with what flows in from my profession, is sufficient to gratify my wishes; indeed so limited is my ambition and that of my nearest connections, that were I precluded from future practice I should be enabled to obtain all I want. And as for fame, what is it? A gilded butt, forever pierced with the arrows of malignancy."

Did the combined temptations of offered wealth and fame ever receive a more fitting reply? And has there ever been penned a more stinging rebuke to the manifest commercial, money-making, fame-seeking spirit pervading the ranks of the profession of the present day? To have an intelligent appreciation of the beauties, the harmonies and the beneficence of nature, with genuine reverence for nature's great Architect; to labor diligently for the prevention and relief of human suffering and the elevation of the race; and at the same time to be content with a competence sufficient to supply all our real wants, is not only a true exemplification of the letter and spirit of our national code of medical ethics, but it is equally an exemplification of the only sure road to human happiness here or hereafter. Such was pre-eminently the life and character of Dr. Edward Jenner, one of the noblest benefactors of the human race.—Journal of American Medical Association, May 9, 1896.

Within the short period of two years after the original pamphlet of Dr. Jenner, entitled: "Inquiry Into the Cause and Effects of the Variolae Vaccinae," London, 1798, it had been trans-

## THE JENNERIAN CENTENNIAL IN BROOKLYN.

Right worthily did the Kings County Medical Society celebrate the first centennial of Jenner's immortal discovery on the 14th ultimo. And rarely was the celebration of any event more admirably justified than was this by the remarks of the two distin-

guished invited guests, Drs. Pepper and Welch, of Philadelphia. Dr. Pepper, especially, was masterly in his estimate of the importance of vaccination and the greatness of Jenner. In part, he said: "Too much attention cannot be paid by us to the worth of Jenner. Very few of us have the desirable amount of knowledge concerning Jenner's life as a man and an original investigator, and his immortal discovery. To him is due that extreme and rare credit of having devised the incalculably valuable scheme of close and patient observation, without which great discoveries in the realm of science are a hopeless dream.

"Jenner's discovery has removed a scourge from the face of the earth. But think how many others still await solution at our hands! Their solution depends upon the methods he put into such successful operation. I have taken the trouble to secure a few statistics of preventable deaths in Philadelphia for the past twenty years. The result is startling. There were 55,000 deaths in that city alone in that time from tuberculosis, 11,500 from typhoid fever, 8,000 from scarlet fever, and 155,000 from various infantile causes, all of which must be included in the list of preventive diseases. If we should personally practice preventive medicine, I am certain our services would be vastly greater to suffering humanity than ever before. It is a higher medicine than that which seeks to quell contagious disease after it has spread over our cities and eaten into the vitals of the people. This is a very serious matter and needs deep thought. We ought to get it planted in our schools and public libraries.

"Municipal and national preventive medicine is also our great need. How much do municipalities appreciate this? How many laboratories do our cities endow? I tell you, that to-day the medical profession is the only profession which is trying forever to restrict its own field of effort and emolument. Yet, when it tries to secure government or city co-operation, it is set upon as if it were trying only to secure personal gain. We should unite in insisting upon the immense importance of these subjects—health, the prevention of disease, and epidemic. Here, in this aggregation of population, soon destined to be the second greatest city in the world, is a magnificent opportunity. Let it lead in showing the world its zeal for the succor of humanity. This is, moreover, a national question. Cities cannot deal largely enough with questions of quarantine, the pollution of the sources of water,

the pollution of our coast waters and the poisoning thereby of our sea-food product. Then there are the great domestic food crops and our food animals. I do not want more centralization in Washington, but modern preventive medicine demands national control. We must speak strongly for humanity and demand recognition for these things. Remember that our duty is to force this question into immediate public recognition."

Dr. Welch chose for his subject the scientific bearings of Jenner's discovery, and its logical consequences in the development of preventive medicine. He characterized the discoverer of vaccine as a thoroughly trained scientific man. "He knew pathology, and knew it well. His investigations were entirely of a scientific character, and no man in medicine has been less selfish in his work. Jenner was the first physician to make a post-mortem examination in the case of angina pectoris, and the discovery of its nature was really due to him. His careful investigation convinced him of the accuracy of his opinion that it was merely an ossification of the coronary arteries. That little monograph of Jenner's on vaccination is one of the classics of the language. It takes rank with Harvey's essay on the heart. It illustrates perfectly his far-reaching, painstaking observation, and his careful study of every aspect of this subject. Dr. Pasteur, whose great discoveries in our own time have electrified the medical world, gives a full credit to Jenner as the source of his inspiration. The theory of preventive medicine is to-day a principle as likely to be as beneficent to humanity as that discovered by Jenner. All of our great discoveries rest on the application of experimental method in medicine. They rest on experimentation on animals; vivisection, if you like it. But it is a necessity. There has never been a time in which great discoveries in medical science have been possible, except through the agency of experimentation. Your society has shown an enlightened spirit in recognizing this opportunity to honor the memory of Jenner, and I thank you for the privilege that you have extended to me to participate in doing honor to his memory."

The memorial medal, given to each guest, is of bronze, and fitly commemorates the occasion. The menu of the banquet quotes Scriptural text as applicable to the great sanitary pioneer: "He stood between the living and the dead, and the plague was stayed."

## MEDICAL EXCERPT.

By T. P. Corbally, A. M., M. D.

Abscess of the Liver.—A unique case of dysenteric abscess of the liver was presented to the Academy of Medicine (La Gazette Hebdomadaire, April 12, 1896) by MM. Peyrot and Roger. The patient was a woman 27 years of age, who contracted dysentery at Nossi Bi. The abscess was opened by incision through the pleura after resecting the tenth rib. There were no bacteria in the pus from the abscess when it was opened. There was a great number of the amibes of Loesch and of Kartolis; these microbes had pseudopodes which measured 26 millimeters in length by 16 in width.

Epithelioma of the Uterus and Vagina has been successfully treated by M. Guinard, who employed a method entirely new. It is described as follows (the Gazette Hebdomadaire of the 12th of April):

He takes a piece of carburet of calcium, the size of a small nut, according to the condition of the epitheliomal growths, and introduces it, without reserve, to the fundus of the vagina, and places it in immediate contact with the diseased parts. It is well known that this substance has, in contact with water, the property of being transformed into oxyde of calcium and acetylene gas. As soon as the contact takes place, the acetylene is seen to effervesce at the base of the vagina.

He rapidly packs the vagina with iodoform gauze, which retains the acetylene in contact with the neoplastic growths. The patient feels a slight burning sensation, which lasts for three or four hours, and then ceases without any application and, four days later, he removes the tampon of gauze and washes freely the vagina with a solution of sublimate, one part to a thousand. It may be necessary to remove with the finger or with a blunt instrument the bits of oxyde of calcium which may be encrusted in the neoplasm, and are drawn down by the washing. It will be seen that this method of operating is very simple and may be performed by any physician without assistance, and needs no special instruments. The carburet of calcium may be procured from most dealers in chemicals at the moderate cost of 2 fr. 50 to 3 fr. a kilogram.

He does not speak definitely of the results to be obtained from this new treatment because his experience extends over a period only of three months, but he affirms that the carburet of calcium, when applied locally, meets successfully the three most grave symptoms of utero-vaginal cancer: first, the hemorrhages; second, the fetid discharges; third, the pains that accompany the course of the disease. From the time the first application is made, all hemorrhage ceases instantly. Besides, the neoplastic excrescences dry up and fall off, leaving a surface smooth and even, and of a uniform grayish color.

The acetylene acts as a hemostatic and the lime as a caustic, but the vaginal fluids rapidly reduce the lime to a hydrate, and thus limit its caustic action.

CUTANEOUS STAPHYLOCOCCIA, gangrenous in character, and returning successively has been described by MM. Gastou and Canuet. As reported (La France Medicale, of May 1st), the patient was a child three and a half years of age, in whom the successive relapses showed a decided tendency to gangrene of multiple origin and having, in many things, the clinical appearance of ecthima and in others the folicular appearance of pustules of an ulcerous character. The disease, in this case, followed an attack of impetigo and lasted about a month, new eruptions breaking out as existing ones began to disappear. It was accompanied with angina, diphtheritic stomatitis, having the character of impetigo, with blepharo-conjunctivitis, coryza, bronchitis and fever.

It does not seem to belong to simple ecthyma, but rather to that group of affections classed as multiple disseminated gangrene of the skin, which does not assume the distinctive characteristics of any particular type of this group.

Anatomically, it is characterized by a diffuse inflammation of the skin, with a tendency to slight changes around the sudoriparous glands and their ducts.

Its bacteriological characteristics would place it with the cutaneous staphylococci, along with impetigo and the furunculi.

DIET IN THE ETIOLOGY AND TREATMENT OF DISEASES OF THE SKIN, as studied by Dr. Smith, has been reported recently in the Deutsche Medizinische Zeitung. The influence of nutrition in the etiology of diseases of the skin is much less than is generally supposed. Indeed, little is known in regard to this subject. The idiosyncrasy, the temperament of individuals, have

much influence in such cases, and the physician should be reserved in laying down general rules for diet in such cases.

Alimentation may, however, influence the skin in many ways. It may influence it through the general nutrition of the organism, for a skin poorly nourished offers less resistance to the destructive influence of microbic and pyogenic agents. The disease is much more frequent among the poor than among those who are well nourished.

Alimentation may influence the condition of the skin by reflex action arising from the digestive organs, nervous or vasomotor disturbance of the skin and urticaria are frequent when the diet is excessive or irritating as a consequence of the use of indigestible articles of diet, and those of an exciting character. The skin may be indirectly affected by the absorption of articles in a state of decomposition, as preserves and the like, by food or liquids of an irritating character, as alcohol.

In some cases the skin is irritated because it serves as the channel for the elimination of some substances, as of oil of essences, or resinous substances, as copaiba, cubebs, turpentine and the like. Patients who are subject to frequent attacks of erythematous and inflammatory eruptions should avoid spices of all kinds.

The writer has arranged cutaneous diseases in three groups:

Skin diseases that are influenced by diet or produced by the condition of nutrition; such are some forms of erythema of urticaria, of pruritis, of acne rosacea and perhaps acne simplex.

Cutaneous diseases in which this relation has not been established are excepted. These are psoriasis, most of the cases of eczema and of common acne. In children, eczema has been attributed to an excess of sugar in the food, but this has not been proved.

It is the same regarding the influence of fish in producing leprosy, and the departure from healthful diet in the production of furunculi. Then boils would be much more frequent in England, where much meat is used, than in France.

Finally, some cutaneous diseases are entirely independent of nutrition, as herpes, pemphigus, ichthyosis, etc.

In consequence of these peculiarities, constitutional and others, in some diseases coffee, tea and rich and highly seasoned food should be carefully excluded; much salt meat should also be rig-

idly excluded, and also fish and alcohol. It is usual not to allow salt in diseases of the skin. However, the writer claims that since he has ceased to recommend this restriction his patients do not seem to have the disease increased.

Alcohol, of itself, does not in all cases provoke skin diseases, but it does cause irritation and congestion of the skin. Patients afflicted with herpes ought, therefore, to be extremely temperate.

ANTIKAMNIA is well spoken of by the London Lancet of March 28, 1896, as an efficient analgesic and antipyretic in the treatment of neuralgia, rheumatism, etc., etc. It is not disagreeable to take, and may be had either in powder or tablet form, the latter being made in five-grain size. It is described as not a preventive of, but rather as affording relief to, existent pain. By the presence in it of the amine group it appears to exert a stimulating rather than a depressing action on the nerve centres and the system generally. If this be so, it possesses advantages over other coal-tar products. The concise indorsement of the Edinburgh Medical Journal, which appeared in the January issue, is equally interesting.—"This is one of the many coal-tar products which have lately been introduced into medicine in Scotland. In doses of three to ten grains, antikamnia appears to act as a speedy and effective antipyretic and analgesic."

PROTONUCLEIN A METABOLIC FORCE.—Dr. T. E. Warden of Springfield, Mo., in a communication to the Medical Mirror, says that he has used it in more than twenty different cases with absolute satisfaction. The first two cases were typhoid fever, same family, same environments, sick about a week when first seen by him; cases almost identical; temperature when first seen ranged 103½. He placed them at once on small doses of calomel and soda, antifebrine in three-grain doses every one, two and three hours as required to control the fever, with three grains of quinine sulph. every four hours. In addition to this he placed one patient on Protonuclein, three grains every three hours; the temperature of the one placed on Protonuclein never ranged higher than 104, and on the fourteenth and fifteenth days temperature was 98 to 99, with marked symptoms of convalescence. The other's temperature gradually increased, ranging from 105 to 105½—one time 106, at the sixteenth day, when he gave in addition to the treatment Protonuclein. In a day and a half to two days, temperature began to gradually decline with a general

amelioration of all symptoms, and on twenty-first and twenty-second days there was little or no fever. Both cases resulted in satisfactory recovery. There next came under observation three cases of malarial fever, from Fort Smith, Ark. A mother of twenty-seven years, and two children—one of four years, the other two years and eleven months. Mother taken sick in Fort Smith came here (her old home). She had been sick about ten days and her physician there thought that Springfield, being her native home, would be beneficial to her, as there was an epidemic of malarial fever raging at Fort Smith at that time. When first seen by him, her temperature was 102½ to 103. As the physician that had been treating her had prepared sufficient medicine, which she had brought with her, he recommended that she continue his line of treatment. But he prescribed for the children, who were suffering from the same malady; one of four years had a temperature of 104; one of two years and eleven months, temperature 105. To each he gave Hydrag. Sub Mur. and Soda Bicarb., and placed them on Protonuclein; the older, two grains every three hours, the younger, one and a half grains every three hours, with a local application of Quinine Alk. in Ol. acid, three grains every three hours. The younger had no fever after the third day, appetite good, sleeping and doing well; the older improved more slowly but had no fever the fifth day, after which rapidly convalesced. All this while the mother was having fever 101½ to 102, complete anorexia, nervousness and insomnia. As her medicine which she brought with her was about exhausted he placed her on Protonuclein Tablets, one every three hours. Her fever in less than a day began to decline and was absent on the second day, appetite improved, nerve tension reduced and she made a rapid recovery.

He has used Protonuclein in three cases of pelvic trouble; first, a lady of twenty-three years, suffering with salpingitis with local peritonitis. He had attended her in previous attacks that required from two and a half to three weeks to recover. The last attack, which was equally as grave if not more so than the prior attacks, he treated with Protonuclein, three grains every three hours, and was able to arrest the trouble in eight days. Second case. Septicaemia, arising from retained secundines following an abortion. When first seen was having recurrent chills, fever, nausea and vomiting, skin sallow, eyes yellow. He placed her on Hydrag. Sub Mur. and Soda Bicarb., Quinine Sulph., Sulph.

and Phos. Soda. Hot water injections to remove debris from the uterus. Case gradually grew worse, for twelve days, when he gave in addition protonuclein every three hours, after which her chills ceased and she gradually recovered, on no other treatment than Protonuclein. Third case. Acute Endometritis following childbirth. Protonuclein locally every day, and a tablet internally every three hours; satisfactory recovery in eight days.

Deep erysipelas and cellulitis in a man of thirty-eight years, following an injury to the face and neck on the left side; formation of pus in the deep cervical cellular tissue; temperature of 105, delirium, nausea and vomiting. Under the ordinary treatment of Iron, Strychnia, Digitalis and Quinine the patient grew worse. He then placed him on Protonuclein, three grains every three hours, day and night, also hypodermic injections; there was marked improvement at once with a gradual recovery, while he had expected a fatal termination of the case. He has used Protonuclein in the treatment of abscesses with good success; in acute bronchitis, and in colds, he considers it excellent. Has used it in two cases of uncomplicated diphtheria, with recovery in six to eight days in both cases. Has used the powder in cases of long standing ulcers with good results, also on extensive burns. The powder excites a new formation of epithelium, and takes the place of skingrafting as in a case he has recently treated —a burn ten or eleven inches wide and fourteen to sixteen inches long on the back; there was the formation of a new covering in four weeks and patient doing well otherwise.

THE TREATMENT OF EPILEPSY.—In the treatment of epilepsy the bromides have long been the sheet anchor, and while other drugs have been recommended from time to time, they have never enjoyed any degree of popularity. Unfortunately, however, the employment of the bromides is not free from disadvantages which are sometimes sufficiently serious to demand their discontinuance. Up to the present time the materia medica has contained no drug which would satisfactorily replace these preparations, but quite recently so high an authority as Prof. S. Weir Mitchell has pointed out that trional may often prove an efficient substitute for the bromides, and states that he has seen no ill effects follow its continued use for many weeks. In the March number of the University Medical Magazine, Dr. H. P. Boyer (Daily Lancet) reports the results obtained by Dr. Mitchell in his clinic for

nervous diseases during the past two years. In most instances where trional was employed the patients were in some way benefited. Either the number of attacks was diminished, their severity lessened or the general physical condition of the patient improved. Of the cases in which it was used thirteen are described in detail, and in the majority of these the results were highly encouraging. In ten of the thirteen cases recorded there was a marked decrease in the number of attacks during the treatment and the physical symptoms also were singularly improved. In five of the cases the number of attacks was less under the trional treatment than under the bromide treatment, while in two others the bromides gave more satisfactory results. The after-effects chiefly complained of were drowsiness and vertigo. It would seem, therefore, from these observations that trional either alone or in combination with bromides may prove an important auxiliary in the therapeutics of epilepsy. In view of the fact that this drug was introduced as an hypnotic, its sedative and antispasmodic properties have not received sufficient attention, and the above observations will—it is to be hoped—lead to its employment in other spasmodic disorders.

DIRTY THERMOMETERS..—Those who are constantly preaching the germ causes of disease are the very fellows who many times are as careless as their unbelieving friends. How frequently do we see physicians take the temperature of their patients, regardless of the existing disease, wipe the instrument with their handkerchief, which is the linen most liable to be full of germs, or a towel, or even use the sheet, and carefully place it away in a case prepared with a small amount of absorbent cotton in the bottom to keep from breaking, and unintentionally preserving the germs from time to time, to be conveyed to the next unfortunate who may be the first patient called upon. This seems to be a very simple thing to discuss, but any reasonable person can readily see the necessity of having his thermometer thoroughly cleaned every time it is used. It should be washed with soap and water, and if any cotton is used in the bottom of your case, let it be sublimated cotton, and occasionally renew it.—*Medical Record.*

# EDITOR'S TABLE.

## Sanitarian, June Number, 1896.

☞ ALL correspondence and exchanges and all publications for review should be addressed to the Editor, DR. A. N. BELL, Brooklyn, N. Y.

### NATIONAL HEALTH SERVICE.

The following report of the Committee of the American Medical Association, at the meeting in Atlanta, May 7, is gratifying to us because of its agreement with our suggestion in the April Number, to accept the Marine Hospital Service as the basis.

Report of the Committee on Department of Public Health:

Our committee was appointed in 1891 with the object in view of securing the passage of a law creating a National Department of Public Health, with a Secretary of Public Health at the head of it, with a seat in the Cabinet of the President of the United States. The bill, which was prepared for presentation to Congress, was extremely crude and indefinite in its provisions, and gave this proposed high official very little important work to do. It was, indeed, found to be so defective that last year the effort to have it enacted into a law was abandoned.

In the meantime, the Marine Hospital Service, which in 1890 had already been invested with some important health functions, was by the Act of 1893 converted into a National Health Department, with very large and far-reaching powers and abundant means. It is not called a department of public health, but is a Department of Public Health in fact.

Since 1893 until the effort was abandoned last year, our Committee has been engaged in the hopeless and unwise enterprise of endeavoring to induce Congress to establish another department of public health—a very weak and inconsiderable department by the side of a very powerful department. Such an effort could not succeed. Such an effort did not deserve to succeed.

It seems to us to be a fundamental proposition that we shall have but one National Department of Public Health. This being conceded, one of three courses remain open to us:

1. We may devise and advocate a plan to deprive the Marine Hospital Service of its public health functions, and for the establishment of an entirely new department; or,

2. We may accept the Marine Hospital Service just as it stands as a department sufficient for our present use; or,

3. We may endeavor to improve the Marine Hospital Service and make it a more satisfactory National Health Department than it now is.

It would seem that this last method promises to be the most fruitful of beneficent results; and the question then arises as to the modifications that may be wisely made in the existing law.

In arranging any scheme of national public health supervision, it would seem desirable that nothing should be done to discredit and weaken the various State Boards of Health. But that, contrarywise, the effort should be to strengthen the State organizations, and to foster and facilitate their further evolution. If this principle is conceded it is at once made evident that the National Department of Public Health should act in and through the State Boards of Health, in co-operation and harmony with them, and not outside of them and independent of them. If the National Department acts within the State independently of the State Boards, and assumes the work that ought to devolve upon the State Boards, then the State Boards become comparatively useless institutions, and will fall into disfavor. Some of the State Boards are still weak institutions, and any rivalry between them and the National Department in State work would doom them to speedy destruction. In this direction it would seem that additional legislation is needed, and the simplest plan to reach the desired reconciliation would embrace two provisions:

1. That the National Department should act within the States by and through and in co-operation with the State Boards.

2. That the head of the National Department should call annually to meet in the city of Washington an Advisory Council to be composed of one representative from every State Board of Health. This would bring about mutual understanding and co-operation and reciprocity of action, and would virtually constitute a great central school of public hygiene.

Such a scheme as this would probably command the approval and support of the National Conference of State Boards of Health, which Conference is quite as deeply interested in movements of this character as is the American Medical Association.

As the conclusion of the whole argument, we recommend that we be authorized to draw up a new bill along the lines we have

indicated, and that we be authorized to invite the co-operation of the Conference of State Boards of Health and of the American Public Health Association in our endeavor to have the proposed bill enacted into law.

All of which is respectfully submitted.

JEROME COCHRAN, M. D., Chairman Committee.

The report was adopted.

The suggestions for accepting the Marine Hospital Service and the laws governing it, with such amendments as may be deemed necessary to secure the thorough co-operation of the State sanitary authorities, as the culmination of a national health service, are still further strengthened by the report of the Supervising Surgeon-General of the Marine Hospital Service, for the fiscal year ending June 30, 1895, now before us. This report is a gain in excellence over the first report, under recent laws (reviewed in our April number), inasmuch as it further demonstrates the adaptability of the Marine Hospital Service to national sanitation co-ordinately with its scope. Though hampered as the service is, in some respects, e. g., its liability to have its authority questioned and resisted, when promptly acting against the possible introduction of an epidemic at ports known to be not well equipped against such emergencies, as has been the case in Florida. But it is alike creditable to the service to take no risks to the country under such circumstances, without waiting to be called upon by the local authorities, as it is for its constant readiness to render prompt assistance when required, as was the case in several instances, during the period reported upon, for the suppression of smallpox.

The national quarantine stations, of which there are twelve, are reported upon in detail. With a few exceptions, they are well equipped and in constant readiness for service.

The whole seacoast of the United States, from Maine to Washington, has been divided into ten inspection districts, and a medical officer detailed to each, whose duty it is to examine and report upon every quarantine station within his territory. Moreover, there are special reports upon the quarantine practice and facilities of several foreign ports, notably Havana, Victoria, British Columbia, and Honolulu.

Cholera, smallpox, and yellow fever are reported upon in detail.

The Hygienic Laboratory, under the charge of P. A. Surgeon J. J. Kinyoun, appears to be equipped and equal to the exigencies of the service not only, but to national requirements.

"In view of the widespread prevalence of typhoid fever during this fall—this being a water-borne disease—and in view of the general interest now manifested concerning the water supply of cities of the United States and the pollution of rivers which furnish the water supply of some cities by the sewage of others, a preliminary investigation has been begun by this Bureau with the object of collecting information from every city of the United States, showing the source of its water supply, the method of its collection, storage, distribution, and disposal, whether it is under municipal, corporate, or individual control, and whether subject to sewage contamination."

Elaborate statistical tables of the operations of the Marine Hospital Service, illustrative of its growth since its reorganization, in 1871; number of sick and disabled seamen furnished relief; diseases and injuries treated; summary of physical examinations, etc., etc.; diagrams, maps, and plates greatly add to the interest and usefulness of the volume.

CHOLERA in Alexandria and Cairo appears to have suggested a timely order from the Secretary of the Treasury designed to prevent, so far as possible, the danger of the spread of it and other contagious diseases by the scattering of immigrants to city and country districts. It provides that after arrival at a quarantine station of a vessel on which there appears or has appeared during the last voyage a case of cholera, smallpox, typhus fever, or plague, and after quarantine measures provided by regulations of the Treasury Department have been enforced and the vessel receives free pratique, notification of the above mentioned facts shall be transmitted by the quarantine officer to the Commissioner of Immigration at the port of arrival, whose duty it shall then be to transmit by mail or telegraph to the State Health authorities of the several States to which immigrants from said vessel are destined, the date of departure, route, number of immigrants, and the point of destination in the respective States of the immigrants from said vessel, together with the statements that said immigrants are from a vessel which has been subject to quarantine by reason of infectious disease, naming the disease. This information is furnished to State Health officers for the purpose

of enabling them to maintain such surveillance over immigrants as they may deem necessary.

PUBLIC BATHS are of primary importance to every dense population. The leading article of this number, describing the recent improvements in their construction, is both an object and practical lesson for their introduction. The author of the article was alive to the improvement from the outset. He was already identified with beneficiary work for the needy; was the organizer and is president of the "Riverside Association," providing the tenement-house population of the West Side of the city with the advantages of a library, gymnasium, kindergarten, boys and girls' clubs, classes for manual training, cooking and sewing, and Penny Provident Trust. Sensible of the advantages of the public bath as a potent factor in the promotion of health and morality, but familiar with its defects as hitherto provided, he was quick to see the advantages of the rain bath and adopt it. It is to be hoped that the time will not be long ere it is also made an appendage to every public school.

THE SALE OF SECOND HAND CLOTHING NOT A NUISANCE —The Supreme Court of North Carolina declares, in the case of State vs. Taft, February 25, 1896, that the sale of second-hand clothing is not a nuisance in itself, but is, on the other hand, a lawful business. As a consequence, it holds that the commissioners of towns authorized to pass laws for abating or preventing nuisances of any kind, and for preserving the health of the citizens, cannot pass an ordinance making it unlawful for any person to import into the town, for the purpose of selling or offering for sale, any second-hand clothing, cloth or bed furniture. But it does say that the town authorities would have the right to compel fumigation and disinfection of second-hand clothing, and that they might require proper assurances, before such articles were imported or offered for sale, that they have not been bought in or brought from markets or places where epidemics of contagious or infectious diseases were or had been recently prevailing, or they might prohibit the further sale of such stocks from which articles had been sold and had communicated disease. In the case of Rosenbaum vs. City of Newbern, decided March 10, 1896, the same court holds valid a city ordinance which imposes a fine of $50 for selling or offering for sale second-hand clothing without having it disinfected by fumigation, and by paying a price fixed according to the nature of the garment, as

set forth in the ordinance, for the city authorities to do the fumigating. Here the court says that the right to buy or sell such articles is not an absolute one, but may be subjected to such restrictions, by the lawmaking power intrusted with the authority, as may be necessary to make its exercise consistent with the safety and security of others.

MORTALITY AND MORBILITY REPORTS AND REVIEWS.

ALABAMA -- *Mobile*, 31,076: J. A. Abrahams, M. D., Health Officer, reports for March: Deaths, 67—19 under five years of age. Annual death rate, 25.8.

*Selma*, 7,622. John A. McKinnon, M. D., registrar, reports for March: Deaths, 2. Death rate, 18.9.

CALIFORNIA.—J. H. Davidson, M.D., President, Los Angeles; J. R. Laine, M. D., Secretary, Sacramento. The Secretary reports for April: Returns from 67 cities, towns, villages, and sanitary districts, aggregating a population of 721,804, show a mortality of 991—annual death rate per 1,000, 16.44.

There were 183 deaths from consumption, 75 from pneumonia, 27 from bronchitis, 7 from congestion of the lungs. Measles was reported epidemic at Cottonwood, Colton, Red Bluff, and Redlands. Whooping cough was reported epidemic at Knight's Ferry, and one case of smallpox was reported at the Napa County Infirmary. Mumps was epidemic at Williams.

*San Francisco*, 330,000: Deaths, 497—112 under five years of age. From consumption, 74; acute pulmonary diseases, 58; from zymotic diseases, 29—5 from typhoid fever. Annual death rate, 18.07.

*Los Angeles*, 100,000: Deaths, 139—27 under five years of age. From consumption, 39; acute pulmonary diseases, 14; from zymotic diseases, 29—3 from typhoid fever; 3 from measles. Annual death rate, 16.68.

COLORADO.—*Denver*, 150,000: William P. Munn, M. D., Health Commissioner. Deaths in April, 20. From phthisis, 29—20 contracted elsewhere. Annual death rate, 9.60.

CONNECTICUT.—Professor William H. Brewer, Ph. D., New Haven, President; Professor C. A. Lindsley, M. D., Secretary, New Haven. The Secretary's *bulletin* for April comprises reports from 163 towns in the State, from which the number of deaths reported for the month was 1,255. The death rate for the larger

towns is 18.3; for the smaller, 19.6, and for the whole State, 18.6. Deaths from zymotic diseases, 157—12.5 per cent. of the total mortality—chiefly from measles; 37 in Hartford, 6 in Waterbury.

DELAWARE.—E. W Cooper, M.D., President, Camden; E. B. Frazer, Secretary, Wilmington.

*Wilmington*, May 8: The new Board of Health has organized by electing Dr. Joseph P. Pyle, President; J. Harvey Spruance, Treasurer, and Charles Ten Weges, Secretary and Registrar.

DISTRICT OF COLUMBIA, white, 187,600; colored, 87,900: 275,500. W. C. Woodward, M. D., Health Officer. Reports for the two weeks ending May 16: Deaths, 187—60 under five years of age. From consumption, 29; pneumonia, 12; zymotic diseases, 22—2 from typhoid fever. Death rates: White, 14.85; colored, 24.36: 17.65.

Annual report for 1895: Deaths, 5,565—2,451 colored; 1,775 were of children under five years of age. Death rates: W., 16.97. C., 28.18; 20.57. The chief causes of death were: Consumption, 777—13.98 per cent. of the total mortality; 1.77 per 1,000 of the white population, and 3.98 per 1,000 of the colored population. Deaths from zymotic diseases, 1,036, chiefly from the following: Diarrhoeal diseases, 300; typhoid fever, 187; diphtheria, 124; epidemic influenza, 87; whooping cough, 58. From the special report on diphtheria and scarlet fever, it appears that the general mortality from diphtheria was less than it has been any year since 1887; 35 per cent. of the cases reported as such were rejected. Seventeen deaths are recorded from croup.—Special report on typhoid fever by Sanitary Inspector George M. Kober, emphasizes the generally recognized cause—polluted water. The mortality reported from this disease is estimated to represent about ten per cent. of the cases.

The water supply is reported upon by J. J. Kinyoun, M. D., U. S. M. H. Service, and Edward Andrade-Penny, M. D. They state, in conclusion:

"It is our opinion, based upon this and other examinations made during the past four years, that the Potomac water is not at all times free from sewage pollution. No river water receiving as large a quantity of sewage as the Potomac, and this, constantly increasing, can ever be above suspicion. * * * The examinations, on the whole, make a better showing than the same number of wells."

"Morbific and Infectious Milk" is the subject of a particularly elaborate and instructive report by Drs. S. C. Busey and G. M. Kober, comprehending all its normal qualities and susceptibilities, abnormal conditions and dangers and how these are brought about. On the whole, the report is creditable to the sanitary service, but disgraceful to the city.

FLORIDA.—Hon. W. B. Henderson, President, Tampa; Joseph Y. Porter, M. D., State Health Officer, Jacksonville. The Secretary's *official bulletin* for April summarises the statistics for February, from 45 counties and 5 cities, exclusive of Jacksonville, Tampa, and Osceola, with an aggregate population of 391,422: Births, 452; marriages, 434; deaths, 232—47 under five years of age. Annual death rate, 6.91. The chief causes of death were: From consumption, 32; pneumonia, 28.

*Pensacola*, 15,000: Report for April: **Deaths, 20—3 under five** years of age. Death rate, 16. Three cases of smallpox, all colored, were reported, and sent to the pest house during the latter part of the month. No later reports.

ILLINOIS.—William E. Quine, M.D., President, Chicago; J. W. Scott, Secretary, Springfield.

*Chicago*, 1,600,000: William R. Kerr, Commissioner, reports for April: Deaths, 2,086—874 under five years of age. Death rate for the month, 1.30; for the year ending April 30, 14.82. Prevailing causes of death and the numbers: From diphtheria, 85; typhoid fever, 33; consumption, 205; pneumonia, 315; bronchitis, 190.

Note on Diphtheria.—There was a sharp decline in the diphtheria deaths reported during the last two weeks of April. To the 15th the daily average had been 3.3; from the 16th to the 30th, inclusive, the average was 1.8 per day. During the month the per cent. of possible sunshine was 66—the normal for this month during the period of observation; but for the first three weeks the per cent. was 71, or nearly 8 per cent. more than the normal. Is there any relation between this and the sharp decline in diphtheria prevalence as indicated by the decline in diphtheria deaths reported subsequent to excess of sunshine?

*Elgin*, May 19: (Republic, St. Louis) There are now three cases of smallpox in Elgin, Ill.

INDIANA.—Douglass C. Ramsey, M. D., President, Mount Vernon; J. N. Hurty, M. D., Secretary, Indianapolis.

*Indianapolis*, April 17, 1896.—Concerning How Certain Foods Shall Be Protected from Dust Pollution.—In many cities and towns it is the custom for grocers, butchers, and other venders of food to expose their wares in front of their shops and stores. Butchers very frequently make an unusual exposure of meats to the dust and filth of the street. Grocers expose on the sidewalks in front of their stores, dried fruits, smoked meats, etc.

Objections.—The dust that floats in the air contains a great deal of filth. It carries pulverized manure, dried catarrhal and consumptive sputum, and much other offensive matter, besides micro-organisms of all kinds. All this we must endure, to the evident disadvantage of our health, when we walk abroad in cities where dust is not kept down. It is not well, however, that we should eat dried manure and dried spittle on our meat and groceries, even if cooked.

What To Do.—County Health Officers are hereby directed to issue written orders to all butchers and venders of meats not to expose outside their shops carcasses or parts of carcasses, of any animal intended for food. Neither shall dressed meats be transported through the streets without being protected from dust.

Grocers must be ordered not to expose dressed poultry, nor uncovered smoked meats, nor uncovered dried fruits, as dried apples, dried peaches, currants, etc., nor, indeed, any foods which may become polluted and corrupted by dust from the air in the way above described.

The Law.—Section 2069, R. S. 1881, gives ample power to health officers in this matter.

J. N. HURTY, State Health Officer.

This admirable admonition (Circular No. 1) is followed by other circulars, with special instructions for the collection of samples of water, Prevention of Typhoid Fever, the Duty of Physicians, Requirements of Health Officers, Rules and Regulations for the Government of Town, City, and County Boards of Health; Care and Management of Dairies, &c., &c., indicating earnest work in a fruitful field of preventable diseases. At the very outset of its work, however, the newly organized board recognizes important deficiency in the State sanitary law, insomuch that, at the quarterly meeting, May 12, the Board adopted the following:

" Whereas, We, the members of the State Board of Health, on

account of study and experience, are forced to the conclusion that the act of 1891, establishing and supporting this board, is only partially operative, is quite inadequate to the ends aimed at, and is much behind the times; therefore, be it

Resolved, That this board will memoralize the Assembly of 1897 to pass an act adequate to secure the proper objects of a health law and repeal the present act."

IOWA.—E. H. Carter, M.D., President, Des Moines; J. F. Kennedy, M. D., Secretary, Des Moines.

May 12: The State Board of Health this morning elected Dr. E. H. Carter as President, and Dr. J. F. Kennedy as Secretary for the ensuing year. The same gentlemen were also elected as delegates to the American Public Health Association, which meets at Buffalo, N. Y., in September.

*Davenport*, 31,484.—May 6: Dr. A. W. Cantwell has been reappointed City Physician. He reports for April: Deaths, 26—10 under five years of age. From pneumonia, 5; consumption, 3; typhoid fever, 1.

LOUISIANA.—S. R. Oliphant, President, New Orleans; G. F. Patton, M. D., Secretary, New Orleans.

*New Orleans*, 275,000—80,000 colored. At the annual meeting, April 13, the State Board was reorganized, quarantine and other officers appointed, as follows:

President, Dr. S. R. Olliphant; vice president, Dr. W. R. Walmsley; secretary-treasurer, Dr. G. F. Patton; quarantine physicians, at Port Eads, Dr. John A. Thomas; at the Rigolets, Dr. W. H. Carson; at the Atchafalaya station, Dr. W. Douglas; attorney of the board, B. B. Howard; chief sanitary inspector, Dr. Will H. Woods; first assistant sanitary inspector, Dr. Howard Olliphant; second assistant sanitary inspector, Dr. T. C. Will; coal oil inspector, S. Hayward; meat inspector, Dr. A. S. Wheeler; chemist, Dr. A. S. Metz; bacteriologist, Dr. P. E. Archinard; shipping inspector, Dr. J. Hope Lamb.

Report for April: Deaths, 730—343 colored; under five years of age, 235—88 colored. Death rates: White, 23.66; colored, 51.45: 31.85. The chief causes of death and the numbers, respectively, were: Smallpox (all colored), 92; consumption, 72; pneumonia, 62.

MARYLAND.—John Morris, M. D., President, Baltimore; James A. Steuart, M. D., Secretary, Baltimore.

*Baltimore*, 496,315—73,747 colored. James F. McShane, M. D., Health Commissioner, reports for April: Deaths, 857; 641 were white and 216 colored; a death rate of 18.18 per thousand for the former and 35.05 per thousand for the latter. The death rate per thousand for the whole population was 20.73; 31 died from infectious diseases, 87 from consumption, 107 from pneumonia, 21 from influenza, 27 from brochitis, 27 from apoplexy, 23 from bright's diease, 37 from nephritis, and 11 from typhoid fever; 270, or 31.50 per cent. of the total deaths were of children under five years of age.

MASSACHUSETTS.—H. P. Walcott, M. D., Chairman, Cambridge; S. W. Abbott, M. D., Secretary, Boston.

*Boston*, 501,083: S. H. Durgin, M. D., Chairman. Deaths in March, 1,048—346 under five years of age. Annual death rate, 25.09 per 1,000. From diphtheria (and croup), 48; scarlatina, 17; typhoid fever, 12; consumption, 97. Cases of contagious diseases reported for the month: Diphtheria, 302; measles, 209; scarlatina, 104; typhoid fever, 27.

The mortality among school children, Dr. Durgin is reported (Journal and Courier, New Haven, May 4) to have said, is larger than in any other city in this country or in foreign countries. This is due largely, he says, to the unsanitary surroundings of the children in school. The rooms are unwashed and full of dust and dirt, the temperature in cold weather is kept abnormally high, and the air the children are compelled to breathe is abominable.—This excessive mortality in Boston is despite a medical supervision of the schools which is claimed to be unique. District physicians are employed at a small salary, who visit the schools each morning, and are given a list of all the pupils who complain of illness or who appear to the teachers to be ill. They examine the children and send home those unfit to be in school, with a report of the disease with which they are afflicted.

MICHIGAN.—Hon. Frank Wells, President, Lansing; Henry B. Baker, M. D., Secretary, Lansing.

The Secretary reports for April: Compared with the average for corresponding months in the ten years, 1886-1895, erysipelas, remittent fever, consumption, intermittent fever, pneumonia, and scarlet fever were less than usually prevalent, and no disease was more than usually prevalent in April, 1896.

Including reports by regular observers and others, consumption was reported present in Michigan in the month of April,

1896, at 247 places, measles at 70 places, scarlet fever at 68 places, diphtheria at 49 places, typhoid fever at 44 places, whooping cough at 26 places, and smallpox at 5 places. Reports from all sources show consumption reported at five places more, diphtheria at nine places more, measles at fifteen places more, scarlet fever at four places less, whooping cough at three places more, smallpox at two places less, and typhoid fever at one place more, in the month of April, 1896, than in the preceding month.

*Detroit*, 250,000: Samuel P. Duffield, M. D., Health Officer, reports for April: Cases of infectious diseases, diphtheria, 23; scarlet fever, 29; typhoid fever, 10; smallpox, 1; measles, 5; chickenpox, 3; whooping cough, 5. Deaths (exclusive of 22 still births and of non-residents), 326. Annual death rate, 15.86 per 1,000.

MINNESOTA.—Franklin Staples, M. D., President, Winona; C. N. Hewitt, M. D., Secretary, Red Wing.

*Minneapolis*, 225,602: H. N. Avery, M. D., Health Commissioner, reports for April: Deaths, 141—43 under five years of age. Deaths from diphtheria, 5; typhoid fever, 4; consumption, 19. Death rate, 10.40.

*St. Paul*, 140,292: Alexander J. Stone, M. D., Commissioner, reports for March: Deaths, 131—51 under five years of age. Annual death rate per 1,000 was 11.20. Deaths from diphtheria (and croup), 2; typhoid fever, 3; consumption, 21.

*Duluth*, May 5 (Herald).—It was reported to the Health Department to-day that six pupils at the Lincoln School had fainted away yesterday in the assembly room, being overcome by the foul air. The pupils to the number of 100 were gathered in the assembly room for singing exercises. The windows had all been closed on account of the bad weather, all access for fresh air being cut off. Six of the scholars, four girls and two boys, swooned, one, a girl, being resuscitated with difficulty.

Verily Duluth is an unfortunate city, in default of sanitary supervision. A month ago, we had occasion to publish the "Health" officer's report for March: "Typhoid fever appears to be dying out."—(!)—There were but 40 cases and 12 deaths" —exhausted by the want of susceptible subjects, there having been 2,020 cases reported during the year ending March 31. How many cases there were not reported, in a community where there is so little attention to air and water—the primary conditions of life and health—is a subject of conjecture.

MISSISSIPPI — *Vicksburg*, April 26: *Smallpox* is reported to be nearing its extinction. Dr. T. G. Birchett, physician in charge of the pest-house, reports sixteen patients in that hospital. Since the pest-house was opened 39 cases have been admitted. The deaths have been few in number, only three in all. Dr. Birchett confidently predicts the early extinction of the disease.

MISSOURI.—F. J. Lutz, M. D., President, St. Louis; Willis P. King, M. D., Secretary, St. Louis.

*St. Louis*, 570,000: M. C. Starkloff, M. D., Commissioner of Health, reports for April: Deaths, 887—239 under five years of age. From diphtheria (and croup), 24; phthisis, 88; pneumonia, 185. Annual death rate per 1,000, 18.67.

*Kansas City*, 150,000: R. P. Waring, M. D., Health Officer, reports for March: Deaths, 206—52 under five years of age. Death rate, 16.5. From diphtheria (and croup), 7; consumption, 4; pneumonia, 17. A case of smallpox, a negro who had been living in Westport, was reported, April 23.

NEW JERSEY.—C. F. Brackett, M. D., President, Princeton; Henry Mitchell, M. D., Secretary, Asbury Park.

Annual Report of the State Board of Health, and Report of the Bureau of Vital Statistics, for the statistical year, ending June 30, 1895, has just been received. The vital statistics are based upon an aggregate population of 1,672,742. Marriages, 15,873; births, 31,742; deaths, 30,634. The 15,783 marriages in the State include 3,283 of non-residents. Most of these were marriages in Camden, of Pennsylvanians. Marriage, birth and death rates, respectively, 9.01; 18.97; 18.31. Returns of births are confessedly incomplete. Average annual death rate for sixteen years, 1879-1894, 19.44. For one year only, in 1885, was it less than for 1895. It was for that year 18.84. Deaths from preventable diseases: Consumption, 3,542; diarrhoeal diseases of children, 3,746; diphtheria, 1,464; typhoid fever, 568; scarlet fever, 264; malarial fever, 144; whooping cough, 272; measles, 95; erysipelas, 74; smallpox, 23.

Consumption was the cause of 11.56 per cent. of the total mortality from all causes. The average number of deaths from this cause for the sixteen years (1879-1894) preceding was 3,303. Per 10,000 of population for the same period, measured by the average census of the two decades, 1880-1890, 23.48. For the year 1895, per 10,000 of population, 21.17.

Considerable progress is shown in the use of bacteriological methods for the diagnosis of tuberculosis and diphtheria; the sanitation of dairies and the protection of the milk supply; and the prevention of blindness—by efforts under a recent statute—to secure skilled professional attendance in cases of young infants who may be threatened with blindness. The Passaic River nuisance has been a constant subject of attention and discussion, but, as shown in our May number, without practical results.

"Am I my brother's keeper?" with reference to the sewage disposal of towns situated on the Passaic, may be paraphrased conversely: I am my brother's murderer.—At a meeting of the State Board, in September last, a resolution was adopted which declared that "the degree of pollution has rapidly increased from year to year, and during the last two summers the gases emitted by the water of the river, below the city of Paterson, have been exceedingly offensive to the sense of smell, rendering dwellings along the borders of the river almost uninhabitable, and greatly damaging the value of property. Said contamination of the waters of the Passaic River and of the air of the locality constitutes a public nuisance, a source of foulness and a cause of sickness hazardous to the public health."

Reports of the local boards are summarized, and some of them ought to be forcible with regard to the Passaic River nuisance. That from Hudson County speaks of the diphtheria epidemic in June, 1895, 160 deaths from typhoid fever in Jersey City, and of the erection of the hospital for contagious diseases at Snake Hill.

*Hudson County—Jersey City* and vicinity, 338,671: Report for April: Deaths, 549—269 under five years of age; from diphtheria (and croup), 23; typhoid fever, 10; malarial fever, 6; total from zymotic diseases, 69; from consumption, 46; pneumonia, 126. Annual death rate, 23.3.

*Newark*, 215,725: Health Officer Lehlbach reports for the four weeks ending May 16: Deaths, 399—115 under five years of age; from diphtheria, 12; consumption, 63; pneumonia, 58. Annual death rate, 24.01.

*Paterson*, 101,808: J. I. Leal, M. D., Health Officer, reports for April: Deaths, 161—66 under five years of age; from diphtheria (and croup), 7; consumption, 19; pneumonia, 25.

What Goes Into the River.—The Commission appointed by the Governor to consider the pollution of the Passaic River held a

meeting in Paterson May 14 and spent two hours discussing the subject. The Commission was welcomed by the Mayor. Dr. Leal, the Health Officer, was called upon to give his views. He said that Paterson was not to blame. Thirty years before her sewer system had been laid out at a cost of millions of dollars, and water had since been diverted to other cities. Remedial measures would appear to portend financial disaster. Other cities would reap the benefit, and the Paterson authorities, while willing to assist in every way, demanded that these cities bear their proper proportion of the expense of requiring Paterson to cease discharging sewage into the drinking water of other people!

City Engineer Ferguson, who followed, explained the course of seven miles of sewers, emptying through sixteen outlets into the river. It was here noted that farmers living along the river bank in Saddle River and Acquackanonk Townships had held indignation meetings last Summer and threatened to destroy the Dundee dam with dynamite. Mr. Ferguson did not believe that the removal of the dam would abate the nuisance. It would rather be accentuated, as ten feet of water drawn off would render the river bed a mud flat. The amount of water running into the sewage flow was about 17,000,000 gallons every twenty-four hours. This would not be materially increased in twenty years. The sewer system of Paterson had been laid out with a view to the shortest route to the river. It was so laid that an intercepting sewer must be erected along both banks. Mr. Hunt here found that there was no provision made to flush the river at Dundee, neither was there an ordinance preventing mills and dye houses from emptying tons of ashes and refuse into the river daily. Six hundred houses built along the banks had built private sewers directly into the river. Ten million gallons of water, impregnated with dyestuffs and chemicals, were also discharged into the stream. William Ryle, Superintendent of the Passaic Water Company, declared there was ample water. In the greatest drought he had a supply of 25,000,000 gallons daily. Had the pollution of the river been prevented by an ironclad ordinance five years before the Dundee nuisance would not exist. The trouble at the dam was caused by Passaic City mill owners running night and day, stretching a ten-hour supply to meet a twenty-four hour demand. The water was drawn off, and an island of corruption obtruded as a natural result. He was pos-

itive that 20,000,000 gallons of sewage were emptied into the river at Paterson daily. A general discussion followed, and the Commission adjourned, promising to arrange for another meeting in the near future.

The Newark Advertiser, April 22d, suggests that there is an understanding among the water syndicates absorbing the watersheds of the State that they do not want the rivers to be purified, but would prefer to see them reeking with filth, so that municipalities will be compelled to buy their water supplies from the private owners in the highlands.

*Trenton*, May 5.—After some contention, the Board of Health has appointed Dr. B. W. McGalliard Health Inspector, instead of Layman, who has hitherto occupied the office. It is to be hoped that the change will not only result in improved sanitary service, but in stated reports showing its progress.

*Uniontown* is reported (Philadelphia Press, May 19) to be under the influence of foul drinking water, or poisoned milk—over thirty cases of typhoid fever, in some families the entire household, is stricken.

" Fish Slime Disease " is a new species of filth disease, present at Cape May, recently described by Dr. Way, of the County Medical Society. He says that it is a species of blood poisoning, distinct from any other kind. If not arrested, the poison spreads through the system and breaks out on all parts of the body. The author of the paper cited many instances of the disease existing along the coast.

NEW YORK.—Daniel Lewis, M. D., President, Syracuse; B. T. Smelzer, M. D., Secretary, Albany.

Bulletin reports for March: Deaths, 11,080, and an estimated death rate of 20.00, against 18.75 for the preceding month. Deaths from consumption, 1,490—200 more than for the corresponding month in 1895. From acute respiratory diseases. 2,310, and the total mortality from zymotic diseases 116.75 per 1,000, from all causes, were about the same. Measles alone among zymotic discases shows an increase as compared with the preceding months and with a year ago; there is a more general distribution, 250 deaths occurring from it, which is a monthly mortality not often reached; a considerable number of deaths occurred in adult life. There were but 370 deaths from diphtheria, the average for March for the past ten years being 525, which represents a diminution

in its mortality from 9 per 100,000 population to 6, or one-third. The death rate from all causes in rural parts of the State was 17.00, against 21.00 in the rest of the State, the percentage of zymotic mortality being six against eleven; of consumption, nine against twelve; acute respiratory diseases, seventeen against twenty-one. One-fifth of the typhoid-fever mortality occurred in rural parts of the State, and less than one-fifteenth of the diphtheria mortality. The mean temperature for the month of the entire State was 25 degrees Fahrenheit, which is 5 degrees below the normal; the mean barometer was 30.02, and the precipitation, as in February, excessive; the prevailing wind was west and northwest, with high velocity.

Annual Report for 1895, reviewed in part in our March number, shows marked progress in the investigation and abatement of nuisances, protection of water supplies, drainage and sewerage throughout the State; and especially praiseworthy energy in the effort to arrest tuberculosis by the eradication of tuberculous cattle. The mortality statistics show that one in eight of the total number of deaths in the State is caused by tuberculosis. That this disease is communicated from man to man, and from animals to man and conversely, is now an accepted truth in the scientific world. That it is especially liable to be communicated to man by means of the milk and its products, and the meat of tuberculous cattle, has been thoroughly demonstrated. And, inasmuch as the diagnosis of the disease in cattle has become comparatively easy by the use of tuberculin, there is no reason to question the duty of sanitary officers to eliminate cattle affected with the disease, as the most certainly effectual means of arresting its progress. "By the certain means of diagnosis now employed, it is possible to eliminate tuberculous cattle from any herd, at a cost that would be small compared with the steady loss entailed hitherto by the neglect of all precautions against the spread of the disease. The eradication of tuberculosis would be a great national gain, and this could not fail to lessen sensibly the prevalence of tuberculosis in human beings, for the relation of the milk supply, especially to infant mortality, is insisted upon by all who have made it a subject of systematic investigation."

*New York City*, 1,995,000: Deaths, 3,907—515 under five years. Death rate, 25.10. Zymotic diseases, per 1,000, from all causes, 119.25; diphtheria (and croup), 150; typhoid fever, 11; consumption, 766; acute respiratory diseases, 915.

*Cases* of contagious diseases reported in the city, in correspondence with the seasons, in 1895, as follows:

*Diphtheria:* First quarter, 2,627; second quarter, 2,924; third quarter, 1,981; fourth quarter, 2,393. Total cases, 9,925.

*Croup:* First quarter, 161; second quarter, 128; third quarter, 67; fourth quarter, 72. Total cases, 428.

*Measles:* First quarter, 1,315; second quarter, 3,414; third quarter, 1,594; fourth quarter, 1,880. Total cases, 8,203.

*Scarlet fever:* First quarter, 1,420; second quarter, 1,126; third quarter, 388; fourth quarter, 874. Total cases, 3,808.

*Typhoid fever:* First quarter, 94; second quarter, 94; third quarter, 335; fourth quarter, 442. Total cases, 965.

*Smallpox:* First quarter, 24; second quarter, 7; third quarter, 2; fourth quarter, 8. Total cases, 41.

*Deaths* from these diseases during the year: Diphtheria, 1,634; croup, 342; measles, 793; scarlet fever, 468; typhoid fever, 322; smallpox, 10.

Tenement-house reforms seem to have begun in earnest. May 27 the Board of Health ordered fifteen of the worst type to be vacated. Some, if not indeed all, of the owners of the condemned tenements, will doubtless contest the order, but the right of property expropriation was conferred upon the Health Board by the law known as the Gilder act, passed on the recommendation of the Tenement House Commission, referred to in our March number, and it will doubtless prevail. The Health Inspectors who examined the tenements that have been condemned discovered that in most of them the death rate was nearly twice the city's average. The houses are said to have been built from fifty to seventy-five years ago, and are very dilapidated. All of them are occupied by Italians. The report, in commenting upon the filthy conditions existing in these houses, says: "How it is possible for people to live under the existing circumstances is difficult to understand.

"The filthy habits of the tenants, together with the faulty and peculiar construction of the houses, render them particularly dangerous to the public health, and the overcrowding which prevails invites and engenders immorality and crime. In our opinion the condition of these premises renders them uninhabitable."

By the destruction of these tenements and others it is to be hoped the way is opened for additional aeration in some of the denser neighborhoods, by not allowing their sites to be again

built upon, and for the erection of improved tenement houses on suitable sites. Model tenement houses are provided for to be constructed under the direction of the "Improved Housing Council," who some time ago invited the submission of plans for a series of models covering a whole city block. In response to this invitation many plans have been submitted in competition by architects, and some prizes have been awarded. But nothing has been brought to our notice which so thoroughly fulfills the basal conditions of a tenement house as the following from A. T. White, Esq., of Brooklyn, the veritable leader of practical tenement house reform in this country. Mr. White and the friends who are incorporated with him in the Improved Dwellings Company of Brooklyn have in their buildings 505 families, comprising 2,100 persons. The healthfulness of these dwellings is proverbial.

The first requisite, Mr. White says, in an improved tenement house, is complete domestic privacy. This means that in the buildings erected by his company the common hall is done away with.

The second requisite is an iron, fire proof stairway, shut off from the interior, and the third is that there shall be no apartment unlighted from the outside. Mr. White says:

"These three nice points have been agreed upon as essentials by those interested in improved dwellings in New York and London, as well as in Brooklyn. In brief, there must be insured domestic privacy, safety from fire and safety from disease.

"It should not be the aim of those building improved dwellings to lower the rentals now paid in the localities of their buildings. The aim, on the contrary, should be to give the most room and conveniences that can be given at present prices. Our rentals range from $6 to $12, and average $9 a month. Six dollars gives a living room, a bedroom and kitchen on the sixth floor."

*Brooklyn*, 1,100,000: Deaths, 1,989—688 under five years. Death rate, 21.17. From zymotic diseases per 1,000 from all causes, 112.00; diphtheria (and croup), 104; typhoid fever, 6; consumption, 203; acute respiratory diseases, 500.

*The Bakeshops* of Brooklyn have recently been made the subject of special report to the Health Commissioner, in consequence, apparently, of the report of the New York Commissioner of Labor Statistics and the more recent publication of the find-

ings of a factory inspection. According to the former, the bakeshops are "all underground and without any method of ventilation." Clearly from the nature of the work and the material used under such conditions, the air is loaded with moisture and is hot and stifling. Moreover, the factory inspector, referring to the bakeshops of both New York and Brooklyn, reports that it was not an infrequent incident to find men sleeping upon boards laid along the dough-mixing troughs, partially clad, with evidences of vermin on their bodies which dropped into the rising dough underneath. Mattresses, damp and moldy from being kept in the cellars, often were found piled upon wholly or partially filled flour barrels, and upon these the men would take turns in sleeping, sometimes covered with ragged and filthy quilts, but generally with no covering other than the clothing worn during their labors. Nearly all the workers in the bakeries were found to be ill, especially from lung troubles.

Yet Sanitary Inspector Purdy reports to the Health Commissioner that the bakeries of Brooklyn throughout are well ventilated and scrupulously clean. A comforting report certainly to the patrons of the bakeries, who may have read the reports of the inspectors of the State Officers, and who never concern themselves with the condition of the bakeries beyond the bread counter and showcase. The word *clean,* however, with regard to the bakeshops in this connection, or indeed to anything else, is of very uncertain significance if accepted without taking into consideration the object, animus and competency of the observer, or inspector.

But bad as the condition of the bakeshops is, even if as reported by the State officers' inspectors, the bread from such bakeshops is clean and wholesome as compared with the dressed poultry and other meats, fruit, vegetables and groceries displayed on the sidewalks from day to day throughout the city, exposed to the dust of dried sputa, horse manure and every other kind of nasty germ-bearing dust wafted by the winds.

The tolerance of this dangerous custom of the foodsellers is on a par with the worst condition reported of the bakeshops. And the same comparison may be made with regard to the tolerance of the underground horse stables, the storage of manure until it putrefies and the manner of disposing of it, to the detriment of the public health.

That diphtheria should continue to prevail in Brooklyn, though unseasonably, under such conditions, is surely no wonder to persons familiar with the nature of that disease. It is sustained by filthy conditions, while it is ever liable to extend beyond them on account of its contagiousness. It has prevailed here for more than twenty years, and for the last twelve years with an average of about 700 deaths annually from it. Last year the number was more than double that average, and the ratio still continues. The sickness rate from this disease is not less than twenty times the number of deaths from it. Yet from week to week the announcement is made by the Chief of the Bureau of Contagious Diseases, or some other official of the Health Department, more or less varied, that "there is no unusual prevalence of the disease, no cause for alarm." Nor, it should be added, any effort to prevent it.

*Buffalo*, 335,709: Deaths, 324—96 under five years. Death rate, 11.60. From zymotic diseases, per 1,000 deaths, from all causes, 145: diphtheria (and croup), 24; acute respiratory diseases, 65; consumption, 40.

*Rochester*, 160,000: Deaths, 199—40 under five years. Death rate, 20.00. From zymotic diseases, per 1,000 deaths, from all causes, 85; consumption, 29; acute respiratory diseases, 17.

*Albany*, 100,000: Deaths, 222—47 under five years. Death rate, 26.65. From zymotic diseases, per 1,000 deaths, from all causes, 102.75; typhoid fever, 17.

*Syracuse*, 100,000: Deaths, 120—27 under five years. Death rate, 14.40. From zymotic diseases per 1,000, deaths from all causes, 60; from consumption, 20; acute lung diseases, 15.

*Elmira*, May 2.—"It has been decided to put in a filtration plant." Deaths from typhoid fever during the two months, March and April, 8.

*Oneonta*, 8,000: O. W. Peck, M. D., Health Officer, reports for the year 1895: Marriages, 112; births, 158; deaths, 139. In reviewing the vital statistics for the year, he observes that "the number of marriages (112) is considerably in excess of any year in the history of the town. The nearest approach to it was in 1891, when 95 marriages were recorded. The average number for the five years immediately preceding '96 was 85.6. Births (158) is not far from the average for the five years preceding, 155. Deaths (139) were somewhat in excess of the year previous,

when fewer deaths occurred, exactly 100, than in any year since 1884." Of the causes of death, there were from heart diseases, 15; consumption, 14; pneumonia, 12. From zymotic diseases, 12; fevers, 7; diphtheria, 4. "A large number of cases of typhoid fever have been reported. . . . I am convinced, however, and have been for many years, that the majority of cases occurring here are not true typhoid fever, that no bacillus could be found. I think they are more properly, in the onset at least, cases of gastric or stomach fever, due in most instances to overfeeding. . . . I have for years noticed that many cases occurred among hop pickers. I have come to attribute this to the good appetites of the pickers, and the abundance of well prepared food which it is customary to set before them. The past year verifies, as others have, the probable truthfulness of the above conclusions. On a certain farm on the border of the town six persons, hop pickers, had enteric fever and were sick for weeks, one in particular, suffered a relapse and came near dying. She was probably sick in bed for six weeks. Two others were also sick, but escaped without a "run" of fever. The family living upon the farm were not sick, neither have they been. All used the same drinking water. I do not believe the water was the cause of their illness. The point I wish to make is often illustrated by persons being taken sick with a fever when away upon a visit or soon after their return. In these latter cases the water is doubtless sometimes the carrier of a true typhoid bacillus."

NORTH CAROLINA.—George G. Thomas, M.D. President, Salem; Richard H. Lewis, M. D., Secretary, Raleigh.

April Bulletin summarizes the reports of 79 counties for March. The principal diseases, named in the order of their greater prevalence, were measles, pneumonia, whooping-cough, influenza, bronchitis, mumps, and typhoid fever. The mortuary statistics for the month, of an aggregate population of 27 towns, 85,772 white and 35,163 colored: Deaths, respectively, 101 and 118, and death rates, 14.1 and 25.6. The chief causes of death were: Consumption, 37; pneumonia, 47; measles, 22; heart disease, 13; from other diseases, 1 to 12. Deaths under five years of age, white, 28; colored, 41; 69.

OHIO.—S. P. Wise, M.D., President, Millersburg; C. O. Probst, M. D., Secretary, Columbus.

At a meeting of the State Board in Cincinnati, April 22 and 23, the Secretary reported upon smallpox at Dayton, Lima and

Zanesville. Smallpox appeared in the work-house at Dayton early in February. The first case had been confined there forty-eight days before he was taken sick, and it is not known how he was exposed to the disease. The disease spread rapidly, and there were 34 cases and 4 deaths among prisoners in the work-house. The disease spread to the city, and 17 cases have occurred outside of the work-house. A prisoner who was liberated February 11th, before smallpox was reported in the work-house, went to Lima and was taken sick there. Six other cases have developed in Lima from this case. The disease made its appearance in Zanesville March 3d. It is alleged that the disease was contracted in Bridgeport by two boys who visited that city and while there slept on a bed lounge which had been used by a smallpox patient some weeks before. Both of these boys took the disease, and three other cases resulted.

(Since these cases were reported to the board another case has developed at Lockland. The origin of the disease is supposed to be Dayton, but this has not been established. The patient was removed to the infectious disease hospital at Cincinnati.)

*Cincinnati*, 350,000: J. W. Prendergast, M. D., Health Officer, reports for April: Deaths 548—193 under five years of age. Death rate, 18.78 per 1,000. From diphtheria (and croup), 9; typhoid fever, 11; consumption, 73; pneumonia, 93; measles, 29.

*Cleveland*, 330,279: J. L. Hess, M. D., Health Officer, reports for April: Deaths, 452—163 under five years; from diphtheria (and croup), 13; typhoid fever, 15; consumption, 43; pneumonia, 53. Death rate, 16.66.

*Toledo*, 122,760: J. T. Woods, M. D., Health Officer, reports for April: Deaths, 133—38 under five years; from diphtheria (and croup), 4; typhoid fever, 2; consumption, 8; pneumonia, 5. Annual death rate, 10.88.

PENNSYLVANIA.—Pemberton Dudley, M.D., President, Philadelphia; Benjamin Lee, M. D., Secretary, Philadelphia.

*Philadelphia*, 1,188,793: Theodore B. Stulb, Health Officer, reports for four weeks ending April 25th: Deaths, 2,074—687 under five years of age. Death rate, 22.67. Deaths from diphtheria (and croup), 75; typhoid fever, 39; consumption, 209; pneumonia, 309.

*Pittsburg*, 275,000: Report for four weeks ending April 25th: Deaths, 396—135 under five years of age; typhoid fever, 18; consumption, 32; pneumonia, 60; bronchitis, 22. Death rate, 18.

SOUTH CAROLINA.—J. R. Bratton, M. D., Chairman, Yorkville; H. D. Fraser, M. D., Secretary, Charleston.

*Charleston*, 65,165—white, 28,870; colored, 36,295. H. B. Horlbeck, M. D., Health Officer, reports for four weeks ending April 25th: Deaths, 163—100 colored. Under five years, 43; deaths from consumption, 27. Annual death rates, white, 19.36; colored, 35.86; 28.0

TENNESSEE.—J. D. Plunkett, M. D., President, Nashville; J. Berrien Lindsley, M. D., Secretary, Nashville.

Bulletin of April 20th reports that the principal diseases, named in the order of their greater prevalence, in the State, for the month of March, were: Lung diseases, acute, measles, la grippe, typhoid fever, consumption, whooping cough, scarlet fever, chickenpox, mumps, smallpox, malarial fever, diphtheria, rheumatism, erysipelas and cerebro-spinal meningitis.

Smallpox in Tennesse for the month ending March 31, 1896: In Memphis there occurred 19 cases; 2 white and 17 colored.

In Shelby County, outside of the city of Memphis, there occurred 27 cases; one white and 26 colored. In the town of Mason, Tipton County, 15 cases, all colored. In Lauderdale County, two cases, colored. In Madison County, one case, colored. Thus making a total of 64 cases (three white and 61 colored) in the State. In all the localities the health officials were prompt and vigilant. Isolation and general vaccination carried out. Also humane treatment of the afflicted. At present the disease is well restricted.

*Memphis*, 55,923—white, 28,064; colored, 27,859. J. J. McGowan, M. D., Secretary of the Board of Health, reports for the month of April: Deaths, 91—46 colored. Death rates, white, 19.24; colored, 19.81: 19.53. Contagious diseases reported during the month: Smallpox, 6; scarlet fever, 4; diphtheria, 3.

TEXAS.—"An act to provide for the construction and maintenance of ditches, drains and water courses, and for the improvement and enlargement of natural drainage of the several counties within the State of Texas," has become a law without the signature of the Governor. It is very comprehensive, and, if effected, well calculated to promote the public health. The Commissioners' Court of any county in the State, at any regular or called session thereof, may, shall have power whenever the same shall be conducive to the public health, convenience or wel-

fare, or where and whenever the same will be of public benefit or utility to cause to be straightened, widened, altered, deepened, any creek, bayou or other stream or water course, and shall cause to be constructed and maintained.

UTAH.—*Salt Lake City*, 48,076: W. T. Dalby, M. D., Health Commissioner, reports for April: Deaths, 47—11 under five years of age. Annual death rate, 8.05. Deaths from zymotic diseases, 7.

WASHINGTON.—*Seattle.*—Health Officer Palmer reports (Post-Intelligencer, May 8) for April: Deaths, 43. Annual death rate, 8.6. Seven cases and four deaths were reported from typhoid fever, as compared with 19 cases and two deaths during the previous month.

WISCONSIN.—Solon Marks, M. D., President, Milwaukee; W. O. B. Wingate, M. D., Secretary, Milwaukee.

*Milwaukee*, 255,000: Walter Kempner, M. D., Commissioner of Health, reports for April: Deaths, 322—141 under five years of age. Annual death rate, 15.15. Deaths from diphtheria (and croup), 12; typhoid fever, 5; consumption, 35; pneumonia, 23; bronchitis, 15. Cases of diphtheria reported during the month, 30; scarlet fever, 9; typhoid fever. 6.

MORTALITY STATISTICS ABROAD FOR THE FIRST QUARTER, 1896.

Population, total mortality, annual death rate per 1,000, and deaths from smallpox and diphtheria.

London, 4,435,955; 24,619; 14.5; 5; 724. Glasgow, 705,052; 3,608; 20.5; 1; 35. Liverpool, 632,512; 3,674; 23.2; 0; 44. Manchester, 529,561; 3,055; 23.1; 0; 24. Birmingham, 501,241; 2,675; 24.3; 0; 85. Leeds, 402,449; 1,867; 18.6; 0; 47. Dublin, 349,594; 2,206; 25.2; 1; 14. Sheffield, 347,278; 1,680; 19.4; 0; 14. Belfast, 277,354; 1,816; 26.2; 0; 16. Edinburgh, 276,514; 1,219; 17.6; 1; 31. Bristol, 230,623; 1,057; 18.3; 1; 14. Nottingham, 229,775; 935; 16.3; 0; 4. Bradford, 228,809; 967; 16.9; 1; 10. Hull, 220,844; 936; 17.0; 0; 16. Newcastle, 212,223; 1,012; 19.1; 0; 17. Salford, 210,707; 1,242; 23.6; 0; 15. Leicester, 198,659; 964; 19.4; 0; 17. Portsmouth, 178,639; 685; 15.3; 0; 9. Cardiff, 162,699; 626; 15.4; 2; 7. Brighton, 120,499; 499; 16.6; 0; 7. Norwich, 108,630; 593; 21.8; 0; 11. Plymouth, 90,276; 413; 18.3; 0; 5. Amsterdam, 451,493; 2,118; 18.8; 0; 48. Rotterdam, 272,042; 1,415; 20.8; 0; 15. La Haye, 180,455; 727; 16.1; 0;

11. Luxembourg, 19,945; 110; 22.1; 0; 2. Paris, 2,424,705; 13,182; 21.7; 10; 153. Lyons, 438,077; 2,407; 22.0; 0; 15. Lille, 200,325; 1,235; 24.7; 0; 9. St. Etienne, 133,443; 809; 24.3; 0; 8. Nantes, 125,029; 743; 23.8; 0; 9. Havre, 116,639; 894; 30.7; 0; 14. Rouen, 111,847; 849; 30.3; 0; 27. Reims, 105,408; 605; 23.0; 0; 19. Nice, 97,720; 585; 23.9; 0; 1. Nancy, 90,748; 576; 25.4; 0; 0. Besançon, 54,636; 298; 21.8; 0; 0. Pau, 33,111; 186; 22.5; 0; 3. Berlin, 1,688,849; 7,486; 17.7; 0; 184. Hamburg, 625,552; 2,710; 17.3; 0; 35. Munich, 406,000; 2,490; 24.5; 0; 58 Leipzig, 403,461; 1,894; 18.8; 0; 79. Breslau, 367,769; 2,229; 24.2; 0; 42. Cologne, 324,000; 1,776; 21.9; 0; 38. Dresden, 320,600; 1,607; 20.0; 0; 38. Frankfort, S. M., 235,052; 952; 16.2; 0; 21. Magdeburg, 215,872; 1,133; 21.0; 0; 51. Hanover, 214,922; 869; 16.2; 0; 32. Dusseldorf, 179,685; 707; 17.1; 0; 23. Koenigsberg, 173,642; 1,167; 26.9; 0; 25. Nuremberg, 164,689; 860; 20.9; 0; 24. Chemnitz, 163,562; 988; 24.2; 0; 29. Stuttgart, 161,485; 635; 15.7; 0; 9. Altona, 149,608; 733; 19.6; 0; 10. Brême, 143,834; 618; 17.2; 0; 16. Stettin, 143,592; 779; 21.7; 0; 24. Elberfeld, 140,716; 596; 16.9; 0; 10. Charlottenburg, 138,931; 510; 14.7; 0; 4. Dantzig, 126,141; 683; 21.7; 0; 7. Halle, 118,040; 602; 20.4; 0; 34. Brunswick, 116,277; 524; 18.0; 0; 12. Aix-la-Chapelle, 111,279; 647; 23.3; 0; 11. Crefeld, 107,486; 475; 17.7; 0; 12. Essen, 98,218; 436; 17.8; 0; 9. Mannheim, 92,523; 424; 18.3; 0; 9. Mayence, 77,528; 338; 17.4; 0; 4. Metz, 65,791; 274; 16.7; 0; 0. Berne, 48,328; 439; 36.3; 0; 8. Bâle, 78,860; 410; 20.8; 0; 23. Genève, 80,111; 469; 23.4; 1; 6. Lausanne, 36,619; 157; 17.1; 0; 0. Zurich, 126,497; 560; 17.7; 0; 10. Chaux-de-Fonds, 31,173; 113; 44.5; 0; 1. Vienne, 1,526,623; 8,936; 23.4; 0; 204. Buda-Pesth, 566,022; 3,796; 26.8; 6; 89. Prague, 364,632; 1,831; 20.1; 0; 15. Trieste, 160,825; 1,124; 28.0; 0; 69. Lemberg, 134,315; 1,047; 31.2; 0; 20; Gratz, 117,944; 842; 28.6; 0; 15. Brünn, 99,060; 702; 28.3; 0; 25. Cracovie, 79,336; 688; 34.7; 0; 23. Pilsen, 54,592; 346; 25.4; 0; 8. Linz, 50,082; 415; 33.1; 0; 15. Copenhagen, 333,714; 1,405; 16.8; 0; 21. Stockholm, 259,304; 1,067; 16.5; 0; 12. Gothembourg, 111,209; 465; 16.7; 0; 20. Christiania, 167,588; 729; 17.4; 0; 4. Helsingfors, 68,132; 319; 18.7; 0; 5. St. Petersburg, 954,400; 8,495; 35.6; 41; 255. Varsovie, 515,654; 2,687; 20.8; 31; 45. Venice, 161,636; 1,423; 35.2; 0; 20. Bologne, 149,088; 1,066; 28.6; 0; 14. Bucharest, 232,009; 1,826; 31.5; 1; 14.

DIPHTHERIA ANTITOXIN IN JAPAN.——There were 353 cases of diphtheria treated by serum injections in Tokio during the year ending November 25, 1895. Of this number 31, or 8.78 per cent., died. In the statistics collected by Kitasato of 26,521 cases of diphtheria in Japan, treated before the introduction of orrotherapy, the number of deaths was 14,996, a mortality of 56.54 per cent.

HEALTH OF ROME.—Malaria is being gradually extinguished in Rome. The deaths from the disease have decreased from 650 in 1881 to 254 in 1891, while for the last five years the average has been 149, the number in 1895 being 125. The population of Rome has increased from 300,000 to 467,000. An equally remarkable diminution has taken place in the death rate for typhoid fever and all other infectious diseases.

ALCOHOLISM IN SWEDEN.—The deaths from alcoholism in Stockholm are reported to amount to ninety per thousand. This is the highest rate in the world.

## CONTEMPORARY LITERATURE.

"THE DISTRIBUTION OF THE SEXES IN THE UNITED STATES."

The proportion of the two sexes at any place and time is regulated by biological and social forces acting in co-operation. Immigration is an insufficient explanation of that proportion in the United States. In all the various elements of the population the females show a tendency to concentration in the cities. This tendency to dissociation of the sexes and concentration of the females in the cities is less marked among the native whites than it is among the negroes of the South and the immigrants of the North.—(Professor Walter F. Wilcox, in the "American Journal of Sociology" for May, University of Chicago Press.)

HOW TO STRENGTHEN THE MEMORY is an interesting question. I think the best way is to use it constantly, making it serve you by giving it definite facts and events to carry, as a packhorse might on a journey. There are many phases of the problem, some people finding that they cannot fix dates in their minds, others forgetting the faces and names of friends, and others still having great trouble in committing anything by rote. Devices of rhymes and associations help some persons, and others simply depend on memoranda, and do not tax their mem-

ories at all. As a rule, the more we give the memory to do, however, the more quickly and faithfully it will respond to our wishes. In little children memory is very retentive, because their minds are at the stage when impressions are easily made; you know the line which says that in childhood our minds are "Wax to receive, and marble to retain." So that we should be very careful indeed about what we say, what we do, and what we teach, where the dear little ones are concerned.-Harper's Round Table.

PROTECTION FOR SCHOOL TEACHERS.—The principal of one of the Chicago public schools was made, the other day, the victim of a peculiarly brutal personal assault on the part of an aggrieved parent whose boy had failed to pass an examination. If the case were an isolated one it would hardly call for comment, but several incidents of the sort have occurred during the past year or two, and the offenders have unfortunately escaped with a trifling fine. This time, it appears, the ruffian is likely to receive something like his deserts. The school authorities are determined to make an example of the assailant, and see that he is punished to the full extent of the law. There are too many parents nowadays who, instead of seconding the disciplinary efforts of their children's instructors, are inclined to antagonize them, and hastily to assume that if a child does not get along well at school it must be the teacher's fault. Instead of taking it out of the boy in the good old way, they take it out of the teacher in the improved modern fashion. A teacher is a public officer, and a physical assault upon a teacher should be treated more seriously than such an offense committed against a private individual. It is a matter of the highest concern to the State that teachers should be made to feel that the law will give them full protection in the discharge of their duties, and that they should not be terrorized into an unduly lenient treatment of idle or vicious children by fear of personal violence. The attack now in question has called out widespread sympathy for its victim, and the criminal proceedings against his assailant will be watched with interest by teachers everywhere.—Harper's Weekly.

THE PYGMY IN THE UNITED STATES.—While looking over some old papers published in New Orleans in 1842, I found a short description of a batch of, presumably, freshly imported slaves. Among them were "six or eight very small negroes, men and women, all of whom were under five feet in height

Who ran in this cargo is not known, but Mr. —— has the disposal of them." An old bill of sale, now in the possession of Mr. Wolfgang Werner, of Savannah, dated April 23, 1810, gives a description of two adult slaves, male and female, in which the height of the male is declared to be "four feet six inches (4 ft. 6 in.), and the female four feet three inches (4 ft. in.)." Finally, in the possession of the Armistede family, of Virginia, there is a letter dated "The Oaks," February 20, 1773, and written by Miss Judith Graeme to her friend, Miss Sarah Armistede. In this letter Miss Graeme bewails the fact that "Pa has bought four of those trifling, good-for-nothing little 'ginny niggers,' who will steal the cloathes off your back if you give them half a chaunce." After giving a page or so of local gossip, Miss Judith closes her letter with a postscript anent the little negroes, who seemed to have aroused her bitterest animosity. Says she: "The biggest one of those nasty little 'ginny niggers' is not five feet high." Thus we see that over a hundred years ago negritos were brought to America and sold as slaves. For all I know to the contrary, these little negroes had been coming into the country ever since slavery was first instituted.—Dr. James Weir, Jr., in Appletons' Popular Science Monthly for May.

THE RUGBY IDEAL. — But besides being one of the stories—which can be counted on one's fingers—that immediately capture and hold the attention of the universal boy, and leave him gasping in eagerness after fine, true, manly, forceful things—there is in "Tom Brown's School Days" the whole round of sympathies for which Mr. Hughes lived. He himself was a Rugby boy under Dr. Arnold. He believed that the life at a great English public school served to bring out the best virtues of the average Englishman. He was himself a notable feature on the football and cricket fields, and held that they were the surest foundations of health, happiness, and manliness in a boy. He loved out-of-door country life with an eager, buoyant strength, which led him to regard it as the greatest regenerating influence on earth for stale minds, hearts, and bodies. His faith was implicitly fixed in the Rugby system of self-government, where the bigger and wiser boys were in rather despotic charge of the smaller ones. He hated bullying worse than any other form of sin, whether it was from a hulking boy at school or grinding social conditions in London. And, finally, Judge Hughes was throughout his life blessed with an untroubled belief in the tenets of the Established

Church. This faith was inextricably blended with his mighty friendships for Arnold, Maurice, and Kingsley, and it was an integral portion of the great Rugby master's system of training his boys.—From "Thomas Hughes and 'Tom Brown,'" by Charles D. Lanier, in May Review of Reviews.

"AT HOME IN VIRGINIA," by Professor Woodrow Wilson, in the May number of "Harper's Magazine," presents Washington as a young man maturing in his provincial community, and gradually taking his right place among his neighbors. This paper contains the episode of his courtship and marriage, and gives many pleasant glimpses of old Virginia life. These papers of Professor Wilson's are remarkably successful in exhibiting a living Washington not yet idealized by the romantic successes of his later years.

WORKINGWOMEN OF LONDON.—Women are everywhere; climbing down from omnibuses; coming up in processions from the underground stations. They are hurrying along Fleet street, and scudding across the Strand. Chelsea and South Kensington are peopled with petticoats. Sainte Mousseline wears a jacket, a cleft hat, and has portfolio or papers under arm. Knowing in dress, preoccupied in air, she nods familiarly and takes out her latch-key to let herself in, or disappears within the door of her club.

This new figure has no place in fiction. That is why we know so little of her. There have been tentative efforts; the stage has opened the door; "the New Woman" attempts to introduce the woman bachelor. We have had the opportunity of seeing Sydney Grundy's play. As a caricature even it was not accepted. The transformation of the British unmarried female into Miss Victoria Vivash has not been so gayly accomplished. Jackets and cigarettes are not the most salient traits.

On the contrary, in London one misses that spirit of adventure, that saucy fillip of the finger at the gray old world which enables the American girl to take up so lightly her wrestle for a livelihood. But where the American girl has gone forth a free-lance, the English woman has advanced in platoons. This is why she is so well entrenched, perhaps. Her outposts also are farther advanced. This has been accomplished neither by daring nor by skill. It has accordingly escaped that attention which is challenged by exceptional feats.—From "Women Bachelors in London," by Mary Gay Humphreys, in the May Scribner's.

BACTERIA AND NERVOUS DISEASES.—Another very large proportion of cases of nervous disease is due directly or indirectly to the action of different forms of bacteria, or disease germs. Nearly all the forms of meningitis, or brain fever, are due to the direct action of different forms of bacteria upon the membranes that cover the brain. Other forms of nervous diseases are now thought to be of infectious nature, due to some specific organism. Others still are due to the action of poisons produced by the germs of other diseases. There is, for example, a form of paralysis which not infrequently follows diphtheria, which is due, not to any weakness of the nervous system, but to the action of the diphtheritic poison upon the peripheral nerves. Similar forms of paralysis may follow smallpox, typhoid fever, pneumonia, or influenza. Many of the diseases of the spinal cord are of similar origin. Locomotor ataxia and general paresis, two common and fatal diseases, are in most cases the result of one of these infectious diseases.—"Are Nervous Diseases Increasing?" by Dr. Philip C. Knapp, in the May Century.

STATE MEDICINE.—A historical retrospect showing the development of higher medical education would note that it has not been purely a voluntary evolution on the part of medical colleges as a rule, but that the motive power has been the power vested in State Boards of Health. Illinois justly can claim the distinction and honor of inaugurating requirements in 1877, from which has since grown the now popular cry for higher medical education. Other States have vied with Illinois in making possible the execution of such a needed reform in medical instruction. Now that the medical colleges have been whipped into line, all are endeavoring to fulfill the requirements of the various States. It is to the indefatigable energy of the late Dr. Rauch, Secretary of the Illinois State Board of Health, who, in spite of such opposition, inaugurated the "Illinois Practice Act," which is the father of all subsequent reforms in Higher Medical Education. It is to the best advantage of the profession, the medical colleges and the public, who indirectly support the cause of medicine, that the requirements of admission be high, the course thorough, and that competition be in the line of the "finished product" (a scientific physician) rather than in numbers "turned out" from the school.—F. P. N., *Medical Fortnightly.*

THE GOLDEN ROD, which is so much admired that some persons have favored its adoption as our national emblem, is getting into disrepute in Wisconsin, where the State Veterinarian, Dr. C. F. Scott, denounces it as poisonous. He says that when it is eaten by horses it produces a fatal disease, resembling consumption. The name, golden rod, is applied to about eighty species of the aster family (*Compositae*) in the United States, all having bright yellow flowers. One species only, *solidago odoro*, is credited with slight medicinal properties—diaphoretic. It would be well for Dr. Scott to more particularly describe the one that is poisonous.

A HEALTHFUL RESORT.—The healthfulness of a summer resort in Devon, England, is advertised by this story:

Recently a visitor began to talk to an old man at Lynton and asked him his age, whereupon he said: "I am just over 70."

"Well," said the visitor, "you look as if you had a good many years to live yet. At what age did your father die?"

"Father dead!" said the man, looking surprised. "Father isn't dead; he's upstairs putting grandfather to bed."

FUNNY "ADS."—Some of the peculiar things London people want are funny without intent, and are so common to London newspapers that an English periodical offered a prize recently for the best collection of such announcements and the following is the result:

"Annual sale now on. Don't go elsewhere to be cheated—come in here." "A lady wants to sell her piano, as she is going abroad, in a strong iron frame." "Wanted, experienced nurse for bottled baby." "Furnished apartments suitable for gentlemen with folding doors." "Wanted, a room by two gentlemen about thirty feet long and twenty feet broad." "Lost, a collie dog by a man on Saturday answering to Jim with a brass collar around his neck and a muzzle." "Wanted, by a respectable girl, her passage to New York; willing to take care of children and a good sailor." "For Sale—A pianoforte, the property of a musician with carved legs." "Mr. Brown, furrier, begs to announce that he will make up gowns, capes, etc., for ladies out of their own skin." "A boy wanted who can open oysters with reference." "Bulldog for sale; will eat anything; very fond of children." "Wanted—An organist, and a boy to blow the same." "Wanted—A boy to be partly outside and partly behind the counter."—*Westminster Gazette.*

## ANNOUNCEMENT.

### The Second Pan-American Medical Congress.

The Committee on Organization of the Second Pan-American Medical Congress has elected Dr. Manuel Carmona y Valle, president; Dr. Rafael Lavista, vice president, and Dr. Eduardo Liceaga, secretary, and has announced November 16, 17, 18, 19, 1896, as the date of the meeting to be held in the City of Mexico.

The most cordial invitation is extended to the medical profession of the United States to attend and participate in the meeting.

Titles of papers to be read should be sent at the earliest practicable date to Dr. Eduardo Liceaga, Calle de San Andres num 4. Ciudad de Mexico D. F. Republica Mexicana.

The date selected is in the midst of the delightful mid-winter season when the climate of Mexico is the most attractive to the northern visitor.

The occasion should stimulate the medical profession of the United States to a most cordial reciprocation of the generous patronage accorded the Washington meeting of the Congress by our Mexican confreres.

It should be remembered that the United States is the largest, and in many regards the most important of the American countries, and that, as a consequence, more is expected of it than of any other Occidental Nation. In no particular is this more true than in the maintenance of position in the realm of scientific medicine on the Western Hemisphere. It is, therefore, simply essential that in this Congress—the most important of all Medical Congresses, in its exclusive, yet broad, American significance—the best thought and the best work of the American profession shall be conspicuous in the proceedings.

The zeal and enthusiasm of the Mexican profession and the active interest of the Mexican Government are co-operating to make the second Pan-American Medical Congress attractive, important, and memorable.

Those who contemplate attending should send their names and addresses at as early a date as possible to Dr. Charles A. L. Reed,

St. Leger Place, Cincinnati, that the Committee in Mexico may be advised of the probable attendance.

WILLIAM PEPPER,
President,

A. M. OWEN,
A. VANDER VEER,
CHARLES. A. L. REED,
Secretary.

International Executive Committee
for the United States.

SANITARY PATENTS OF RECENT ISSUE SPECIALLY REPORTED FOR THE SANITARIAN BY EDW. S. DUVALL, JR., SOLICITOR OF PATENTS, WASHINGTON, D. C.

553,640. Garbage receptacle. J. A. Bowen, Washington, D. C. Consists of a pivoted panel adapted to form a closure, a support for a receptacle extending at an angle from said panel, and a receptacle pivotally mounted on said support.

553,641. Method of cleansing filters. W. M. Deutsch, Elizabeth, N. J. Consists in compressing air within the bed and strainer by pressure of a body of water, and allowing the compressed air and water to escape suddenly.

553,846. Sanitary communion service. C. Forbes, Rochester, N. Y. A sanitary cup rack, having cup holders for individual communion cups in parallel ranks and dust-excluding cup covers, each of which is common to a rank of cups, and is movable vertically and laterally to expose the cups beneath for the filling operation.

554,280. Liquid filter. T. Linke, New York, N. Y.

554,281. Combined faucet and filter. T. Linke and H. E. Gould, New York, N. Y.

554,891. Dust collector. Ezra Miller, Canal Dover, O.

555,019. Apparatus for rapid heating and purification of water. J. E. Prunty, Baltimore, Md. Consists of a heater, a filter from which to supply water to said heater, a three-way valve through which water may be drawn off from the heater, and a distributing tank and a water-cooling device, connecting with said valve.

555,020. Filter. W. Railton, Liverpool, Eng. A filtering chamber formed of perforated corrugated sections or rings, se-

cured together, and forming collectively the outer wall of said filtering chamber.

554,877. Apparatus for treating garbage. B. F. Howland, Philadelphia, Pa. Consists of digesters and means for elevating the garbage thereinto, the storage tank receiving the contents of the digesters, and having the screen or grating in its upper portion, the conveyers at the side of said storage tank communicating with the chamber of said tank above said screen or grating, said tank also having an upwardly inclined conveyor arranged along and upon its correspondingly inclined bottom, and inwardly inclined trough, extending from said bottom and in alignment therewith, and provided with a perforated false bottom, said conveyor also extending into said trough and along its false bottom.

556,420. Garbage crematory. W. L. Johnson, Chicago, Ill. Consists of a grate, with gravity-feed, propulsive blast pipes contiguous to the grate, and an agitative blast-pipe situated below the grate, and adapted to disintegrate the mass, and to suspend portions thereof within the combustion chamber.

557,075. Filter. G. Lang, St. Louis, Mo.

557,399. Filter. E. M. Knight, New York, N. Y. A filter disk or diaphragm, the periphery or outer edge of which has a tubular binding, flexibly united to it, and adapted to form a self-adjusting water-tight joint, with the wall of the containing vessel.

557,786. Sewer inlet. G. A. Ensign, Defiance, O. Consists of a body or casing, a removably connected grating, a removable cover, and interlocking devices, normally securing the cover to the body or casing, and a locking device between the cover and grating.

558,328. Filter. G. W. Upton, Warren, O. A conical inclosing casing provided with inlets and outlets for unfiltered water, a conical filtering body or medium depending in said casing, a rotary shaft, having blades thereon, brush-carrying spring arms carried by said shaft extended along the exterior of said filtering cone, and a deflector for directing the unfiltered water against said blades.

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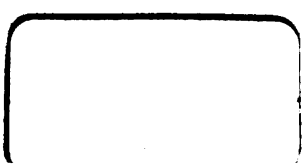

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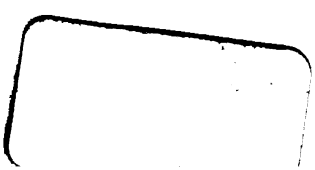
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